The Effect of Alcohol and Energy Drink Co-ingestion on Objective and Subjective Intoxication

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I declare that this report is my own work and that the contributions of the others have been duly acknowledged

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Abstract

Studies of the effect of alcohol mixing with energy drinks (AmED) on objective intoxication (i.e., breath alcohol concentration, BrAC%), and subjective intensity of intoxication, and experience of stimulation and sedation have shown mixed findings. A possible explanation is low ecological validity in terms of the volume and method of dose administration. The current study aimed to examine changes in objective and subjective intoxication across the intoxication curve following alcohol and EDs doses, administration using a multi-dosing method that mimics real-world drinking practices. A within-subject, placebo-controlled design was employed, where participants (N = 27, 14 males) attended two experimental sessions in counterbalanced order: alcohol with 625mL soda water (alcohol condition) or 625mL ED (AmED condition) and then had their BrAC measured and completed subjective measures of intoxication, stimulation and sedation on a regular basis. Results revealed that participants had moderate-large magnitude decreases in BrAC, subjective ratings of 'intoxication', 'impairment', 'mental fatigue' and higher 'legally ability to drive' ratings during the AmED condition as compared to ED. However, no difference in 'stimulation' and 'sedation' ratings were found between AmED and alcohol condition. Results reflecting the negative effect of AmED, where this beverage exacerbate consumers' accuracy in perceiving their intoxication level. The current study also suggests that instead of stimulation and sedation, impairments and fatigue may be stronger cues for drinkers at informing their subjective intoxication level.

Introduction

The trend of mixing alcohol with energy drinks (ED) (AmED) has become increasingly popular globally since the 1990s (Reissig, Strain, & Griffiths, 2009). The trend has received attention from researchers, as emerging evidence suggests that this drinking practice leads to greater alcohol-related harms compared to drinking alcohol alone (Marczinski & Fillmore, 2014). Researchers theorised that this is due to the stimulant (eg: caffeine) in the ED that masks the depressant cues of alcohol, causing a 'wide awake drunkenness' effect, where consumers underestimate their intoxication level, and thus increase AmED consumers' likelihood to engage in risky behaviours (Ferreira, de Mello, Pompeia, & de Souza-Formigoni, 2006). However, majority of experimental studies found (Peacock, Bruno, Martin, & Carr, 2013) no evidence for such effect. Those studies have been criticised for administering relatively low doses of alcohol and ED (eg: 250mL standard ED) compared to real-world consumption dosage (typically 2.4 standard ED) (Peacock, Bruno, & Martin, 2012a) and only assessing the ascending limb of intoxication, neglecting to consider that alcohols effects are biphasic in nature. These potential methodological flaws may explain why existing findings did not support the wide-awake drunkenness hypothesis.

However, a competing theory exists, this theory proposes that instead of altering the intensity of intoxication, AmED may change the nature of intoxication (Attwood, Rogers, Ataya, Adams, & Munafo, 2012). AmED has been suggested to change the nature of intoxication by studies which have identified increased ratings of subjective stimulation and decreased ratings of sedation in AmED treatment conditions compared to alcohol alone (Attwood, Rogers, Ataya, Adams, & Munafo, 2012). Several studies have also suggested that objective intoxication (as measured by breath alcohol concentration, BrAC) was lowered when greater of EDs dosage

were administered, as sugar has reduced the alcohol absorption rate (Lubman et al., 2013). The mixed findings in supporting each of the theories leading to the aim of current study to examine whether AmED alters the intensity, nature and objective intoxication across the intoxication curve.

Alcohol

Prevalence of Alcohol Use in the Australian Population

Consumption of alcohol is a common phenomenon in Australia as it is entwined with many social and cultural activities (Australian Institutes of Health and Welfare; AIHW, 2016). To reduce the risk of acute alcohol-related injuries, the National Health and Medical Research Council (NHMRC) recommend healthy individuals drink no more than four standard alcoholic drinks on a single occasion (NHMRC, 2009). However, the National Drug Strategy Household Survey 2013 (NDSHS) reported that substantial proportion of drinkers (aged 18-25 years) had exceeded the recommended guideline, with one in two consuming more than 4 standard drinks in a single drinking session. The NDSHS 2013 also indicates that 18-25 year olds are the most vulnerable population, as they are more likely to be involved in acute alcohol-related injuries (AIHW, 2016).

Pharmacokinetics

As alcohol is ingested, it passes along the digestive tract. Majority of alcohol is absorbed in the small intestine due to its' large surface area, a smaller extent of absorption also occurs in the stomach (Holt, 1981; Sullivan & Pfefferbaum, 2014). Alcohol absorption rate is influenced by gastric emptying rate, and the emptying rate varies when there is presence of food and other substances (eg: nicotine, medication) (Holt, 1981). Alcohol is then distributed from plasma into organs and tissues proportionate to their water content (Sullivan & Pfefferbaum, 2014). The blood

alcohol concentration (BAC) usually peaks around 30-45 minutes after consumption of one standard alcoholic drink (containing 10g of alcohol) (NHMRC, 2009). Alcohol is metabolised via liver and the elimination rate is relatively constant (approximately one standard drink per hour) (Holt, 1981).

Pharmacological Effects of Alcohol

Alcohol is classified as a sedative drug as it is a central nervous system (CNS) depressant. Specifically, it enhances the effects of the inhibitory neurotransmitter, gamma-aminobutyric acid (GABA), and decreases activity at the excitatory *N*-methyl-D-aspartic acid (NMDA) glutamate receptors. This results in producing sedative effects and behavioural impairment (Zoethout, Delgado, Ippel, Dahan, & van Gerven, 2011). However, alcohol is biphasic in nature, illustrated through a curvilinear time-concentration alcohol curve (Figure 1). Stimulant effects (eg: relaxation, elation and talkativeness) are typically evident with a low dose of alcohol (breath alcohol concentration, BrAC < 0.06%) on the ascending limb of the intoxication curve. Whereas, sedative effects (eg: drowsiness, nausea, cognitive and psychomotor impairment) evident with a higher dose of alcohol (BrAC > 0.06%) and on the descending limb of the intoxication curve (Addicott, Marsh-Richard, Mathias, & Dougherty, 2007)

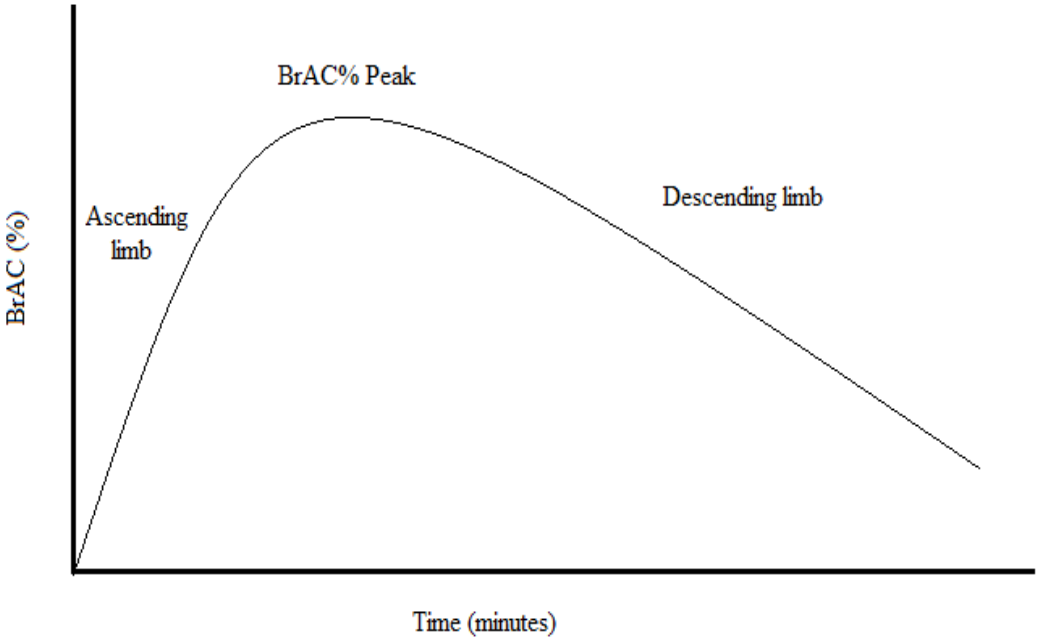

Figure 1. The breath alcohol concentration curve.

Related Harms

Alcohol has pleasurable and desirable effects if consumed in moderation (e.g.: relaxation and decrease social inhibition) (Lee, Maggs, Neighbors, & Patrick, 2011; NHMRC, 2009). However, higher level of consumption may cause a range of acute alcohol-related harms for the drinkers and for others. The acute harms can include drink driving, traffic accidents, unprotected sexual activities, violence, aggression and unintentional injuries that may lead to death (Hart & Burns, 2016; Park, Kim, Gellis, Zaso, & Maisto, 2014). Drink driving is the most likely risky activity undertaken by the Australian general population especially the younger population (aged 14 and above). Indeed, over half of the serious road injuries occurred among the younger population aged from 15-24 (AIHW, 2016; NHMRC, 2009). Additionally, alcohol consumption may also cause others to experience harm

(e.g.: verbal and physical abuse) especially the younger population aged from 18-24 (Laslett et al., 2011).

Subjective Intoxication

When individuals are objectively more intoxicated, salient physiological and behavioural intoxication cues will be produced. These cues serve a function, in allowing drinkers to estimate their subjective intoxication (eg: the extent on to which a drinker feels intoxicated) (Quinn & Fromme, 2012). Accurate subjective intoxication is adaptive whereby it cues drinkers to stop drinking and avoid risky behaviours (e.g.: drink driving) (Quinn & Fromme, 2012; Ray, MacKillop, Leventhal, & Hutchison, 2009). Unfortunately, drinkers are poor estimators of their intoxication level (Marczinski & Fillmore, 2009). For example, at a lower intoxication level, drinkers usually overestimate their intoxication and at a higher intoxication level, they usually underestimate their objective intoxication is high (Grant, LaBrie, Hummer, & Lac, 2012). Underestimation of intoxication level especially when objective intoxication is high is relatively maladaptive as this is associated with greater willingness to engage in risky behaviours (Proestakis et al., 2013).

The development of tolerance is a major factor that contributes to inaccurate estimation of intoxication. Alcohol tolerance develops over time, where drinkers' sensitivity towards the effect of alcohol are reduced and hence, a higher alcohol dose is required to reinstate the initial effect (Marczinski & Fillmore, 2009). However, the decrease of the effect of alcohol, especially at the descending intoxication curve within a single drinking session also occurs (known as acute tolerance). This implies that despite of having equivalent BrAC at both of the intoxication limbs, drinkers will feels less intoxicated and stimulated at the descending limb, which increases

their tendency to engage in risky behaviour, especially drink driving, as decision to drive often occurs at the end of a drinking occasion (Marczinski & Fillmore, 2009).

Energy Drinks

Energy drinks have been endorsed due to their purported enhanced cognitive function and subjective stimulant effects: increase attention, improve mood and reduce mental fatigue. EDs, since the release of Red Bull© in the 1990s have become increasingly popular. A survey conducted by Pennay et al. (2015) suggested that young adults (aged 18-24) are the major consumers, where one-third (37%) of this population had consumed ED in the past three months.

Energy Drink Constituents

EDs are classified as 'formulated caffeine beverages' (Australian Beverages, 2014). The main stimulant ingredients of ED are caffeine, sugar in combination with other 'energy-enhancing' ingredients such as taurine, glucuronolactone, amino acids, vitamins, and herbal extracts (Burrows, Pursey, Neve, & Stanwell, 2013; Yunusa & Ahmad, 2012). The components of the primary ED brand purchase in Australia are shown in Table 1. Below is an overview of the major components of ED (caffeine and sugar).

Table 1

Pharmacological Substances Contained in Red Bull

Ingredient	**Quantity per 250ml serve**
Caffeine	80mg
Sugars	
Sucrose	21.5g
Glucose	5.25g
Taurine	1000mg
Glucuronolactone	600mg
Inositol	50mg
B-complex vitamins	
Vitamin B3 (niacin)	20mg
Vitamin B5 (panothetic acid)	5mg
Vitamin B6 (pyridoxine)	5mg
Vitamin B12 (cobalamin)	5mcg

Caffeine

Caffeine is a psychostimulant drug that rapidly distributes throughout the body and reaches peak concentration in approximately 30 minutes. Caffeine is then metabolised through the liver and requires 3-6 hours to eliminate half of the caffeine dosage consumed (Rogers, 2007). Caffeine inhibits the effect of adenosine (sleep promoting neurotransmitter), which produces wake-promoting effects (Ferre, 2008). Indeed, research suggests that even a low dose of caffeine (50mg) is able to produce subjective improvement of alertness, concentration and reduced sleepiness in regular caffeine users (Smith, 2002). However, high caffeine dosage intake, especially by those who are sensitive to caffeine may produce negative effects such as feeling anxiety, jittery, tremor, insomnia and hyperactive. With concern of the potential adverse effects, the Food Standard Australia New Zealand (FSANZ) (2015) guideline recommends regular caffeine users to drink no more than 200mg per day. As a standard 250mL ED in Australia containing 80mg of caffeine (which is comparable to the caffeine amount in instant coffee), the FSANZ guideline recommend to consume no more than two cans of 250mL standard EDs (160 mg of caffeine) or one can of 500mL of ED to avoid the caffeine overdose (Australian Beverages, 2013).

Sugar

Some research suggests that the sugar in the ED could also contribute in producing the stimulatory effects of ED (McLellan & Lieberman, 2012; Smit, Cotton, Hughes, & Rogers, 2004). Sugar is the main source of energy for the body and is necessary for normal functioning of the CNS (Sieber & Traystman, 1992). Glucose level peaks approximately 20 minutes after glucose intake and will still remain elevated after an hour consumption (Smit et al., 2004). The fall in plasma

glucose concentration indicates glucose uptake by the brain (Wenk, 1989). The sugar content in the ED varies from 21-34g per 250mL serving and is comparable to sugar content in carbonated soft drinks (both have approximately 10g/mL of sugar). Research suggests that acute consumption of sugar (25mg) has improved the cognitive performances (e.g.: memory and attentional tasks). Furthermore, sugar consumption (regardless of the dosage) has been shown to increase subjective mood (eg: feeling alert), however, mood may be influenced by the level of sugar deprivation due to fasting prior the experiment (Owen, Scholey, Finnegan, Hu, & Sunram-Lea, 2012).

Alcohol mixed with Energy Drinks (AmED)

Prevalence of Used and Motivation for Consumption

The popularity of ED in the last decade has contributed to the emergence of a new trend, the co-ingestion of spirits with EDs (AmED) (eg: Vodka Red Bull) (Peacock, Bruno, & Martin, 2012b). Research conducted by Pennay et al. (2015) found that AmED trend in Australia is still relatively modest, where 4.6% of the Australia population reported they had consumed AmED in the past three months. However, AmED consumption practice is most likely to be endorsed by the younger population (aged from 18-24) (26.4%) and the main reasons that motivate them is for recreational purposes: to gain pleasure, maintain energy throughout the night, and for the pleasurable taste (O'Brien, McCoy, Rhodes, Wagoner, & Wolfson, 2008; Peacock et al., 2012b).

Associated Harm

There is emerging evidence suggesting that AmED consumption increases the risks of alcohol-related harm (Thombs et al., 2010). An on-premise study suggested that AmED consumers are more likely to drink for a longer period of time

and exit bar later, consume more alcoholic drinks, have higher level of intoxication than alcohol consumers and more likely to drink drive than alcohol consumers (Thombs et al., 2010; Woolsey et al., 2015). However, these studies examined the difference between AmED and alcohol consumers, and hence, they are unable to differentiate whether such behavioural differences are due to individual characteristic differences (eg: impulsivity, risk taking propensity) or due to the effects of EDs (Peacock, Pennay, Droste, Bruno, & Lubman, 2014). As such, no direct causation between AmED consumptions and increase of risk taking behaviours could be implied from these studies. A within-subject experimental study conducted by Peacock et al. (2013) aimed to examine risk taking, found no difference in risk taking between AmED and alcohol only conditions, despite of controlling for the individual risk-taking differences. Evidence suggests the causal relationship between AmED consumption and increased of risk-taking behaviours remains uncertain.

Subjective Intoxication

The Wide-Awake Drunkenness Hypothesis

Researchers have proposed that AmED is potentially harmful as consumers are more likely to underestimate their intoxication level; this is known as the ‘wide-awake drunkenness’ effect (Arria & O'Brien, 2011). As ED is a stimulant, it is theorised that it may mask the depressant effect of alcohol (e.g.: fatigue). Hence, AmED consumers may be unable to accurately utilise the physiological and psychological intoxication cues and underestimate their intoxication level, despite similar objective intoxication (i.e., breath alcohol concentration, BrAC%). This state may impact their decision making, and mean they are more likely to engage in risky

drinking practices and alcohol-related-behaviours (Ferreira et al., 2006; van de Loo et al., 2016).

Caffeine and Alcohol Interaction

As caffeine is the major stimulant ingredient in ED, studies had directly examined the wide-awake drunkenness effect in combination of alcohol with caffeine.(Attwood et al., 2012). However, the existing literature (Table 2) challenges the notion of wide-wake drunkenness effect. Both studies conducted by Marczinski and Fillmore (2003 & 2006) found no significant differences in perceived intoxication ratings between the alcohol/caffeine active and the alcohol/caffeine placebo treatment condition. In contrast, Heinz, de Wit, Lilje, and Kassel (2013) found those administered with higher caffeine doses (350 or 385mg) and alcohol had significantly lower intoxication ratings as compared to the treatment group that had no caffeine with alcohol. This finding may suggest that the effects are caffeine dose-dependent, where intensity of intoxication are lowered when higher caffeine doses (200 to 250 mg of caffeine, equivalent to 2.5 to 3 cans of ED) are administered and majority of the studies administered a relatively low caffeine doses (87 and 174mg of caffeine, equivalent to 1 to 2 cans of ED).

Instead of altering perceived intensity intoxication, Attwood, et al. (2012) found that alcohol with 140mg of caffeine treatment condition had significantly greater stimulative effects as compared to alcohol with caffeine placebo condition. Smith (2013) found similar results, where alcohol with higher dose of caffeine (375mg) treatment group had higher alertness ratings, but not for the moderate caffeine doses (187.5mg) treatment group. Additionally, Attwood, et al. (2012) and Marzinski (2003) also found a trend of lower sedative ratings in alcohol with caffeine treatment group as compared to alcohol with caffeine placebo treatment

group and this may suggest that mixing alcohol with caffeine may alter the nature of intoxication rather than affecting perceived intensity of subjective intoxication. However, these studies administered anhydrous caffeine powder, which may not be generalizable to the effects of the whole ED beverage and hence direct experimental manipulation with ED is required (Heinz, et al., 2013).

Table 2

Summary of Experimental Studies that Examined the Effect of Alcohol × Caffeine Interaction on The Objective Intoxication, Intensity and Nature of Alcohol

Author	*N*	Experimental Design	Treatment Variables	Stimulative Measure	Sedative Measure	Subjective Intoxication Measure	Time Point measures	Findings
Marczinski & Fillmore (2003)	12	Double-blinded, placebo, controlled, within subject design	Alcohol: 0.65mg/kg Caffeine: 0.00mg/kg, or 2.0mg/kg, or 4.0mg/kg	BAES[a]	BAES[b]	BRS	Subjective measures: 30 minutes after drinks begun BAC: 30, 50, 65, 90 minutes after drinks begun	No difference in BAC, subjective intoxication, stimulative and sedative ratings[#].
Marczinski & Fillmore (2006)	12	Double-blinded, placebo, controlled, within	Alcohol: 0.00mg/kg or	NA	NA	BRS	Subjective measure: 55 minutes after drinking.	No difference in BAC

		subject design	0.65mg/kg Anhydrous caffeine: 0.0mg/kg, or 2.0mg/kg, or 4.0mg/kg				Objective measure: 60, 45, 60, and 90 minutes after drinking	Alcohol + 2.0mg/kg of caffeine treatment condition perceived lower alcohol intake as compared to alcohol + caffeine placebo treatment condition[#]. However, no difference between alcohol + 4.0mg/kg caffeine and alcohol/ caffeine placebo treatment condition [#.]
Attwood, et al. (2012)	28	Double-blinded, placebo, controlled, within subject design	Alcohol: 0.6g/kg Anhydrous caffeine: 0.0mg/kg, or 2.0mg/kg,	BAES[a]	BAES[b]	VAS[a]	Subjective measures: baseline, 10 minutes post administration of drinks, and prior leaving (time interval was not given).	Objective Intoxication **(**NA) Ratings of stimulation in alcohol+ caffeine treatment condition increased overtime, however in alcohol+ caffeine placebo treatment condition decrease overtime[*.] No difference in sedative ratings[#].

								No difference in intoxication ratings.
Heinz, et al. (2013)	146	Double-blinded, placebo-controlled, mixed design	Doses were calculated based on weight and gender. Alcohol: BAC between 0.06%g/dL and 0.08%g/dL. Caffeine: Female = 5.0mg/kg; Men = 5.5mg/kg	BAES[a]	BAES[b]	SIS VAS[b]: Perceived ability to drive	BAC and subjective measures: predrink, postdrink (45 minutes after first drink began), and at the end of session (180 minutes after first dink began).	Objective Intoxication **(**NA) No difference in stimulative and sedative rating[#.] Alcohol+ caffeine treatment condition had lower subjective intoxication ratings*. No difference in perceived ability to drive[#].

			(~ 2.5 to 3 cans of ED caffeine content)					
Smith (2013)	46	Double-blinded, placebo-controlled, between subject design, multiple dosing at 3 intervals	Alcohol: No or 3×330mL of 4.3% lager (34g alcohol) Caffeine: 3×62.5mg or 3×125mg of Guarana extracts	VAMS	VAMS	NA	Subjective measures Pre-drink, After first, second and third drinks (every 30 minutes)	Objective Intoxication (NA) Second drinks: Alcohol + 125mg caffeine treatment condition had higher alertness ratings as compared to alcohol + no caffeine treatment condition*. Third drinks: Alcohol+ 62.5mg caffeine and alcohol+ no caffeine treatment condition had lower alertness ratings as compared to No alcohol conditions*, but no difference when given 125mg caffeine#.

Note. *: significantly different (p <. 05) between treatment conditions, #: no significant different (p > .05) between treatment conditions; POMS: Profile of Mood State; VAS[a]: 100mm visual analogue scale (rate on current state of alertness, confident, dizziness, drowsiness, feeling impatient, jittery, relaxed, tiredness and feeling headache); BAC: blood alcohol concentration; BAES: Biphasic Alcohol Effects Scale, [a] indicates Stimulative Subscale and [b] indicates Sedative Subscale; BRS: Beverage Rating Scale (rate on perceived alcohol consumption, between 0 and 10 standard drinks); NA: not assessed; SIS: Subjective Intoxication Scale ranging from 1 (not intoxicated at all) to 10 (as intoxicated as I've ever been); VAS[b]: 10mm visual analogue scale with opposite anchors labelled as 'could not drive at all', 'could drive as I normally do'; VAMS: visual analogue mood rating scales, which has 18 bipolar scales comprised of a pair of adjectives (eg: happy-sad) and measure three main factors, hedonic tone, anxiety and alertness.

AmED Subjective Intoxication

Experimental studies that directly examined the 'wide awake drunkenness' effect by using whole ED beverage (Table 3) also found contradictory findings. None of the studies reviewed in Table 3 found differences in intoxication perception ratings between AmED and alcohol alone treatment condition. With exception for van de Loo et al. (2016), who found that AmED treatment condition had significantly lower intoxication ratings at the descending limb of intoxication curve (0.02% BAC). Additionally, despite non-significant differences between conditions, VanderNiet (2014) (*g*s > 0.40) and Forward (2015) (*g*s > 0.44) found moderate-large magnitudes of lower intoxication ratings in the AmED condition since 30 minutes post-administration (peak caffeine concentration in plasma).

Several experimental studies also found that co-ingestion of alcohol with ED may enhance the experience of stimulation. For example, within-subject studies with administration of one standard ED, conducted by Marczinski, Fillmore, Henges, Ramsey, and Young (2012a), Peacock et al. (2013), found that AmED treatment condition had significantly higher perception of stimulation at ascending intoxication limb, as compared to the alcohol alone treatment condition. Despite non-significant differences, with administration of 3 standard EDs, VanderNiet (2014) found a moderate-large magnitude increase of delayed stimulation ($g = 0.48$) effect at the ascending limb and lower sedation (*g*s > 0.42) ratings at the descending limb in the AmED condition. Furthermore, Ferreira et al. (2006) found with administration of one 250mL standard ED, participants in the AmED condition had significantly lower negative physiological cues: headache, weaknesses, dry mouth and impairment of motor coordination, however there were no difference in other 14 depressant cues. Ulbrich et al. (2013) replicated the former study found additional lower ratings of

depressant intoxication ratings: weakness, motor coordination, dizziness, agitation and alteration in sight. van de Loo et al. (2016) also found the AmED treatment condition had significantly lower perception of sleepiness at the descending limb of intoxication curve (0.08% and 0.05% of BAC).

Instead of supporting the 'wide-awake drunkenness' effects: masking the alcohol depressant cues in AmED consumers that causes them to underestimate their intoxication level, these findings tend to support Attwood et al. (2012) claim, where co-ingestion of alcohol with ED/caffeine might alter the nature of alcohol, which may lead AmED consumers perceive fewer sedative effects and higher stimulative effects.

Table 3

Summary of Experimental Studies that Examined the Effect of AmED on The Objective Intoxication, Subjective Intoxication and The Nature of Alcohol

Author	*N*	Experimental Design	Treatment variables	Stimulative Measure	Sedative Measure	Subjective intoxication Measure	Time point measures	Findings
Ferreira, et al. (2006)	26	Double-blinded, placebo-controlled, mixed design	**Vodka:** 0.6g/kg or 1.0g/kg **ED:** 3.57kg/mL of Red Bull	ASSS	ASSS	NA	**BAC**: Baseline, 13, 30, 60, 90, 120 and 150 minutes after administration of alcohol **Subjective Measure**: Baseline, 30 and 120 minutes after administration of alcohol	No difference in BrAC. AmED treatment condition had lower perception of headache, weakness, dry mouth, and impairment of motor coordination*.
Forward (2015)	16	Placebo-controlled, within-	**Vodka:** targeted	BAES[a]	BAES[b]	SES	**BrAC & Subjective Meausures:**	Decreased of BrAC in AmED treatment condition*.

		subject, double-blinded	BrAC at 0.08% **ED:** 3 × 250mL Red Bull				**12 time** points (25-185 mins post-beverage initation)	Lower subjective intoxication, sedative, higher stimulative ratings in AmED treatment condition[#].
Lubman, et al. (2013)	30	Placebo-controlled, double-blinded, mixed design, counterbalanced for ED dose and Sex	**Vodka:** 0.00g/kg or 0.50g/kg or 0.65g/kg **ED:** 0 or 1 or 2 or 3 × 250mL Redbull	BAES[a]	BAES[b]	SES BRS	**BAC:** 30, 50, 55, 105, 110, 150, 170 mins post-beverage initiation	BAC were lower in all time point with all moderate Alcohol with all three ED treatment conditions*.
								BAC were lower at all time point with high alcohol with 2 & 3 ED treatment conditions*.
							Subjection Measure: Baseline, 30 & 170 mins post-beverage initiation	No difference in subjective intoxication, stimulative and sedative ratings[#].

Marczinski, et al. (2012a)	18	Double-blinded, placebo-controlled, within subject design	**Vodka:** Male = 0.65g/kg; Female = 0.57g/kg **ED:** 3.57kg/mL of Red bull	BAES[a]	BAES[b]	Subjective Effect Ratings Intoxication Rating	**BAC**: 30, 40, 70, 80, 90, and 120 minutes after drinking **Subjective Measures**: 50 minutes post administration of beverages.	No difference in BAC, sedative, subjective intoxication, and ability to drive ratings[#]. AmED treatment condition had higher stimulative ratings*. Fatigue ratings are lower in AmED as compared to alcohol/ED placebo*.
Marczinski, et al. (2012b)	80	Double-blinded, placebo-controlled, counterbalance for gender, between subject design	**Vodka:** Male = 0.91ml/kg; Female = 0.79ml/kg dose (reaching BAC of 0.04g%)	BAES[a]	BAES[b]	BRS Desire-for-Drug-Scale	**BAC**: baseline, 20, 40, 60, 80 after drinking began **BAES**: baseline, 30 and 55 minutes after drinking began	No difference in BrAC, sedative, stimulative and subjective intoxication AmED treatment condition had higher 'desire for alcohol' ratings as compared to alcohol/ED placebo treatment condition*.

			ED: 1.82 kg/mL of Red bull (~ ½ of 250mL standard ED)				BRS: baseline and 61 minutes after drinking began. **Drugs Desire Scale**: 10, 20, 40, 60, 80 minutes after drinking began	
Alford, et al. (2012)	20	Double-blinded, placebo-controlled, counterbalance, and mixed design, multi-dosing at two different intervals	**Vodka**: Calculated for BrAC = 0.01% for 2 doses) **ED**: 2×250mL Red Bull	Bipolar-VAS	Bipolar-VAS	NA	**BrAC & Subjective Measures**: Baseline, 45 minutes after administration of 1st drinks began and 45 minutes after administration of 2nd drink began	No difference in BrAC[#]. 45 minutes after administration of first drink, there were no difference in stimulative and sedative ratings[#]. 45 minutes after administration of second drinks, alcohol/ED placebo treatment condition had lower drowsiness ratings and higher energetic ratings as compared to AmED treatment condition*.

Ulbrich, et al. (2013)	52	Randomised, double-blinded, placebo-controlled, within subject design	**Vodka**: 46.5g **ED**: 3.57kg/mL of Red bull	ASSS	ASSS	NA	**BrAC**: Baseline, 15, 30, 60, 90, 120, 150 post administration of beverage. **Subjective Measure**: Baseline, 30, 75, and 120 minutes post administration of beverage.	No difference in BrAC[#]. AmED treatment condition had lower perception of weakness, motor coordination, dizziness, agitation, and alteration in sight[*].
Peacock, et al. (2013)	28	Single-blinded, placebo-controlled, within-subject design	**Vodka**: Male = 0.50g/kg; Female = 0.43g/kg of alcohol	BAES[a]	BAES[b]	SES BRS	**BrAC**: baseline, 30, 40, 55 and 125 minutes post administration of beverage.	No difference in BrAC, sedative ratings, and subjective intoxication[#]. Only 30 minutes post administration of beverage, AmED treatment condition had higher stimulative ratings as compared to alcohol/ED placebo[*].

			ED: 3.57ml/kg of Red Bull or Placebo-Red Bull				**Subjective Measures**: baseline, 30 and 125 minutes post administration of beverage.	
VanderNiet (2014)	18	Placebo-controlled, within-subject, double-blinded, multi dosing	**Vodka:** targeted BrAC at 0.08% **ED:** 3 × 250mL Red Bull	BAES[a]	BAES[b]	SES	**BrAC & Subjective Measures**: 20, 40, 80, 100, 170, 190 mins post-beverage initiation	BrAC were lower at all time points in AmED treatment conditionas compared to Alcohol+ED placebo condition*. Lower subjective intoxication, sedation, & higher stimulation (*g*s > 0.48) in AmED treatment condition[#]
van de Loo, et al. (2016)	56	Double-blinded, randomized, placebo, within-subject design	**Alcohol**: Dose was adjusted for body weight and sex	NA	KSS	VAS[b]	**BAC**: Baseline, every 5 to 10 minutes to establish BAC 0.08%, 0.05% and 0.02%	No difference in BAC. AmED treatment condition had lower ratings of sleepiness in BAC level of 0.08% and 0.05%.

	(BAC reaching 0.08%) **ED**: 3.57ml/kg of Red Bull or Placebo-Red Bull	**Subjective Measures**: Measure as each BAC level of 0%, 0.08%, 0.05% and 0.02%	AmED treatment condition had lower intoxication ratings only when BAC level at 0.02%*.

Note. *: significantly different ($p < .05$) between treatment conditions; [#]: no significant difference ($p > .05$) between treatment conditions; 3.57ml/kg of ED = 1 standard 250mL of ED; NA: not assessed; ASSS (100mm Visual Analogue Scale-VAS of Subjective Symptoms): 18 somatic symptoms items (tiredness, headache, dizziness, tremor, weakness, muscular tension, nausea, salivation, perspiration, visual disturbance, tachycardia, difficulty in breathing or walking, agitation, alteration in motor coordination, hearing, and speech, sensation of well-being); BrAC: breath alcohol concentration; Subject Effect Ratings: participants were required to rate how much they 'feel the drink', 'like the effects', overall impairment, mental fatigue and ability to drive on a 100mm VAS ranging from 'not at all' to 'very much'; Intoxication Ratings/BRS (Beverage Rating Scale): assessed of perceived alcohol consumed (ranging from 0-10 bottles of beer) and ED intake (ranging from 0-3 standard ED); BAC: Blood alcohol concentration; BAES (Biphasic Alcohol Effects Scale): [a]:Stimulative subscale and [b]:Sedative subscale; Desire-for-Drug-Scale: participants were to rate how much they 'feel the drinks', 'like the effects' and 'desire more alcohol' on a 100mm VAS ranging from 'not at all' to 'very much'; Bipolar-VAS: 100mm VAS representing bipolar adjective pairs (clearheaded-muzzy, clumsy-well coordinated, energetic-lethargic, drowsy-alert, and mentally slow-quick witted) which assessed the stimulative and sedative effects of alcohol; SES (Subjective Effects Scale): participants were to rate their intoxication, impairment, mental fatigue and ability to drive level on 100mm VAS; KSS (Karolinska sleepiness scale): assessed subjective perception of sleepiness ranging from (1:extremely alert) to (9:extremely sleepy); VAS[b]: 10mm-VAS to assess subjective intoxication ranging from (0:sober) to (10:highly intoxicated).

Objective Intoxication

Majority of the studies reviewed (Table 2 and 3) did not find differences in objective intoxication (as measured by breath alcohol concentration, BrAC%) between AmED and alcohol alone conditions, suggesting that AmED affects the intensity and nature of intoxication but not the BrAC. However, with administration of higher ED doses (2 to 3 250mL standard ED) in Lubman et al. (2013), VanderNiet (2014) and Forward (2015) studies found that participants in AmED treatment condition had significantly lower BrAC as compared to alcohol alone condition. Furthermore, Forward (2015) found that there was a 20 minutes delay for AmED treatment condition to reach the peak of BrAC.

Since the presence of food affects the alcohol absorption rate, it is suggested that the high sugar-content from higher doses of ED mimics the consumption of food, which attenuate the motility of the stomach and thus the gastric emptying rate. Subsequently, the absorption rate of alcohol in small intestine is delayed and lengthening of the absorption time of alcohol in AmED treatment condition resulting in lower BrAC (Holton, 1981). Furthermore, slower rate of gastric emptying results in a greater amount of alcohol to be metabolised in the stomach, which also leads to lower BrAC (Gentry, 2000). Hence, it is also possible that sugar content in the ED lowers the objective intoxication, which may cause AmED consumers to perceive less intoxication as they are objectively less intoxicated. Lower BrAC may also cue AmED consumers to drink more, as they perceive less subjective stimulation and sedation (Marczinski et al., 2012a)

Methodological Flaws in Existing Research

The lack of evidence in finding BrAC differences and supporting the ‘wide-awake drunkenness effect’ suggests the need to overcome methodological flaws in

present literature to clarify the causation effects of AmED. The major limitation is the administration of ED doses that are lower than the 'real-world' doses (Miller, 2013). A field study conducted by Peacock et al. (2012a) found that AmED users on average consumed of 2.4 standard EDs on a single drinking occasion. However, most of the studies (Table 3) administered a relatively low dose of ED (one 250mL standard ED) and the mixed findings in previous studies may be due to the lack of ecological validity. Furthermore, studies which administered EDs dosage (240mg of caffeine equivalent to 3 standard EDs) that were comparable to the naturalistic settings, found lower BrAC and perception of intoxication in AmED condition, suggesting that caffeine may have a dose-dependent effect (Forward, 2015; VanderNiet, 2014).

Additionally, majority of current literature administered the bolus dosing approach, where large amount of beverage was given prior measures were taken. This approach is inconsistent with the real-world pace-out drinking practice, which suggesting the need to mimic such practice and administering beverages across experimental session.

Most of the studies neglect that effect of alcohol is biphasic and they only assessed the ascending limb. As sedative effects are produced at the descending limb, neglecting the descending limb may not be able to assess the change in sedative perception after consuming AmED (Holdstock & de Wit, 1998). For example, with assessment of descending limb in Forward (2015) studies there was a trend of lower subjective sedative ratings at the descending limb of intoxication. These studies highlight the importance of assessing the whole intoxication curve. Furthermore, majority of reviewed studies only assessed subjective judgements at a

very few time-points and which may have not been sensitive enough to detect subjective differences.

Introduction to Current Study

The present study aimed to enhance the ecological validity and examine the effect of AmED when 1.) a more naturalistic dosage of EDs (2.5 standards ED) were given, 2.) beverages were administered across experimental session, and 3.) assess the subjective judgements throughout the intoxication curve at 19 different time points.

The primary aim of this study was to examine effects of AmED by comparing the differences between AmED and Alcohol Alone conditions on a.) objective intoxication (i.e., BrAC%) b.) perceived intensity of intoxication (as measured by feeling 'intoxicated', 'impairment', 'mentally fatigued', 'ability to drive') and c.) the perceived nature of intoxication (i.e., stimulative and sedative aspects).

In keeping with previous studies, it is hypothesised that participants in the AmED condition will have lower BrAC, subjective intoxication, feeling of mentally fatigue, impaired, and alcohol consumption ratings as compared to alcohol alone treatment condition across the intoxication curve. Ratings on the ability to drive are also hypothesised to be higher in the AmED treatment condition across the intoxication curve. It is also hypothesised that participants in AmED treatment condition will have higher stimulation and lower sedative ratings compared to alcohol/ED placebo treatment condition across the intoxication curve.

Method

Participants

The sample consisted of 27 participants (14 males). Participants were recruited via advertisement on social media and throughout the University of Tasmania.

The inclusion criteria included: a.) age between 18 and 35, b.) English as first language, c.) completed Year-12 education, d.) had 4-28 caffeine products in preceding week e.) had at least one standard 250mL ED in the preceding month, f.) had at least 5 standard alcoholic drinks in the preceding month, g.) normal sleeping pattern (eg: 6 to 10 hours per night) to minimise differential effects of fatigue (Alhola & Polo-Kantola, 2007), and i.) body mass index (BMI: 18.5-31.0) to minimise the differential of alcohol and caffeine absorption rate due to body mass/size (Foster & Marriott, 2006).

The exclusion criteria included: a.) weekly smokers as nicotine attenuates the gastric emptying rate of alcohol (Johnson, Horowitz, Maddox, Wishart, & Shearman, 1991), b.) history of neurological disorders, c.) significant psychological distress (Kessler Psychological Scale; K-10 score $\geq$ 30) (Kessler et al., 2002) , d.) use of illicit drugs in the past six months and/or currently undertaking prescription medications, e.) history of drugs or alcohol use disorder (Alcohol Use Disorder Identification Test score $\geq$ 16; AUDIT) (Barber, et al. 2001) which indicates likely alcohol dependence (Lundin, Hallgren, Balliu, & Forsell, 2015), and f.) significant intellectual disability (aged normed quotient $\leq$ 70) in Wechsler Test of Adult Reading (WTAR) (Wechsler, 2001).

Materials

Alcohol, Caffeine and ED Intake Measures

The Alcohol Timeline Follow-Back Questionnaire (Sobell & Sobell, 1992a) was used to assess participants' standard alcohol intake in the past 30 days (Appendix B1) .

A Caffeine and Energy Drink Use Questionnaire was used to assess participants' average caffeine intake per week (mg), ED intake frequency per month, and the typical and maximum ED intake per drinking day (Appendix C4).

Objective Intoxication Measure

Breath alcohol concentration (BrAC%) was measured by using a Andatech AlcoSense Prodigy Breathalyser, calibrated to Australian standards.

Subjective Intoxication Measures

The Subjective Effects Scale (SES) (Appendix B2) is a 100mm visual analogue scale with anchors 'not at all' (0) and 'extremely' (100) that was used to assess participants' subjective perception of 'intoxication', 'impairment', 'mental fatigue', 'ability to drive', 'stimulation' and 'sedation' level.

The Biphasic Alcohol Effects Scale (BAES) (Martin, Earleywine, Musty, Perrine, & Swift, 1993) (Appendix B3) is a 14-items, comprising two subscale: stimulation (eg: elated, talkative) and sedation, that was used to measure the nature of intoxication. Participants were required to report their current experience on a 11-point Likert Scale, with anchors ranging from not at all (0) to extremely (10). The higher the score (range 0 to 70) on a subscale indicates greater perception of stimulation/sedation.

The Beverage Rating Scale (BRS) was a measure to assess whether participants were blinded to their conditions (Appendix B4). Participants estimated

the numbers of standard alcoholic drinks (0 to 9 standard drinks) and ED (0 to 3 250mL standard drinks) they had consumed in a single dosing interval and within the whole session.

Treatment Condition and Administration

Participants were randomly assigned into a counterbalanced treatment administration order: active alcohol/active ED (AmED) and active alcohol/placebo ED (alcohol) treatment condition (Table 5). The counterbalancing was performed prior to recruitment by an independent party.

The alcohol administration was single-blinded and the ED was double-blinded. The dosage of alcohol and EDs administered were to mimic the average dosage consumption of AmED users (on average 7 standards alcoholic drinks and 2.4 standards ED) in a naturalistic drinking occasion (Peacock et al., 2012a). As the reported alcohol consumption had exceeded the NHMRC (2009) alcohol intake guideline, five standard alcoholic drinks (37.5% a/v Smirnoff Red Bull No. 21 vodka) were administered instead, to minimise the acute alcohol harm meanwhile still closely reflecting the real-world drinking dosage. A total of 2.5 standard ED of Red Bull was administered in the AmED condition and the EDs were replaced by soda water in the alcohol condition. To conceal the taste, appearance and smell, all beverages were blended with sugar-free syrups and served in opaque bottles. Furthermore, beverages were administered at four different dosing intervals (Table 4) to mimic the real-world drinking situation where drinkers drink steadily throughout the night. Double dosing was given at the first dosing interval to mimic pre-drinking and followed by administering Vodka Red Bull dosage that is sold in the bar.

Table 4

The Beverage Content and Volume at Four Administration Time Points

		AmED Condition		Alcohol Condition	
	Expected BrAC (%)	**Active Alcohol Dose (mL)**	**Active ED Dose (mL)**	**Active Alcohol Dose (mL)**	**Placebo ED dose (mL)**
Administration 1 (0 Minutes)	0.05	2 Standard Drinks (67.5)	1 Standard Drink (250)	2 Standard Drinks (67.5)	250 soda water
Administration 2 (40 Minutes)	0.06	1 Standard Drink (33.8)	0.5 Standard Drink (125)	1 Standard Drink (33.8)	125 soda water
Administration 3 (80 Minutes)	0.07	1 Standard Drink (33.8)	0.5 Standard Drink (125)	1 Standard Drink (33.8)	125 soda water
Administration 4 (120 Minutes)	0.08	1 Standard Drink (33.8)	0.5 Standard Drink (125)	1 Standard Drink (33.8)	125 soda water

Note. All beverages contained Torani brand sugar-free syrups; the first administration beverages contained 23.34mL English toffee, 46.67mL

peppermint and black cherry; the second, third, and fourth administration contained 11.67mL of English toffee, 23.33mL of peppermint and black cherry.

Procedure

Interested participants were first directed to an online screening questionnaire to assess their eligibility (Appendix C4). They then attended a 60 minutes familiarisation session where informed consent was obtained, completing additional questionnaires and familiarised with the experiment. Participants then attended two 240 minutes sessions which commenced at a consistent time (9am or 1pm). Sessions commenced 4 to 14 days apart after the first session to ensure substance washout and maintain task familiarisation. Prior each session, participants were required to abstain from: alcohol, prescription medication, and nicotine for 24 hours, caffeine products for eight hours, exercise for four hours, and illicit drugs throughout the course of participation. They were also asked to abstain from food for 4 hours prior each session, however had a standardised light meal (two pieces of bread) one-hour prior to session commencement.

Prior to commencement of each session, participants were required to sign an abstinence requirement form (Appendix C3). Participants then completed the subjective baseline measures (the SES and the BAES) and their BrAC was taken to ensure alcohol abstinence. The first beverage was then administered and they were instructed to drink steadily across a 10 minute interval. Beverages were administered every 30 minutes post-consumption of the first beverage at 3 time points (Figure 2). After a 10 minutes absorption period, participants' BrAC and subjective intoxication ratings (SES) were measured at 18 different time points (from 10-220 minutes post-administration of first beverage), the BAES (from 20- 210 minutes post administration of first drink) and the BRS (from 30-220 minutes post-administration of first drink) at 6 different time points (Figure 2).

At the end of each session, participants were fed and discharged once their BrAC were below 0.03% on three consecutive readings. At their end of second session, they were reimbursed with $80.

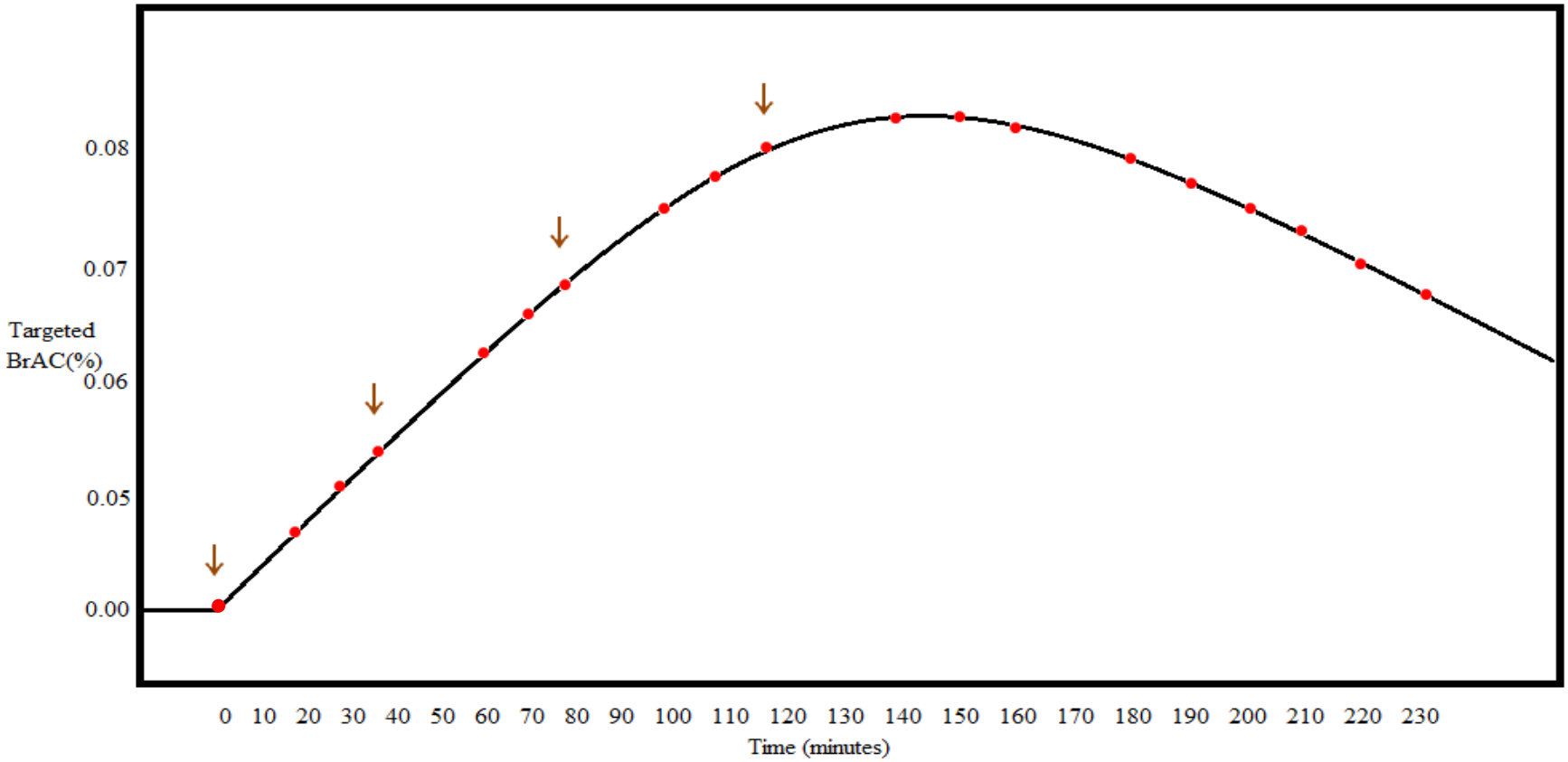

Figure 2. The targeted BrAC by time graph to illustrate the procedure of both sessions.

NB. Each testing points of SES and BrAC are indicated by ● at baseline, 10, 20, 30, 50, 60, 70, 90, 100, 110, 130, 140, 150, 170, 180, 190, 200, 210, 220 minutes post-administration of first beverage. The BAES was administered at baseline, 20, 60, 100, 140, 180, 210 post-administration

of first beverage. The BRS was measured at baseline,30, 70, 110, 150, 190, 220 post-administration of first beverage. The ↓ indicates the time points where beverages were administered: 0, 40, 80 and 120 minutes.

Design and Analysis

The current study used a placebo controlled, counterbalanced, 2 (Condition: Alcohol condition, AmED condition) × 19 (Time: 0, 10, 20, 30, 50, 60, 70, 90, 100, 110, 130, 140, 150, 170, 180, 190, 200, 210, 220× 2 (Sex: Male, Female) × 2 (Session: Session 1, Session 2) design. The 19 time-points mentioned were used in the analysis for the BrAC and the SES. Fewer time-points were used for the BAES (20, 60, 100, 140, 180, 210) and the BRS (70, 110, 150, 190, 220). Dependent variables were BrAC, SES measures (Feeling 'Intoxicated', 'Impaired', 'Mentally Fatigued', 'Legally Able to Drive', Stimulated, Sedated), BAES measures (Stimulation and Sedation effects), BRS: (perceived consumed of ED). Mixed Models for Repeated Measures with an unstructured covariance matrix were conducted using IBM SPSS Statistics v23. Condition and Time were included as fixed effects, and Subject was included as random effect to account for intra-individual variation. Sex and Session were also included as fixed effects to increase model fit and to examine any sex differences and practice or anchor effects. BrAC were included as covariate in all of the subjective measures, aiming to control for BrAC differences between conditions.

As the aim of this study was to examine the objective and subjective effects of AmED across the intoxication curve, tests of simple main effects of Condition at each time-point were conducted, regardless of statistical significance. To minimise concerns of inflation of Type I errors, magnitude of these differences was uniformly calculated and used to aid interpretation. Two- and three-way interactions involving Sex were only followed up if they were statistically significant.

Of 27 participants, two participants had partial data as they completed the first session only (both completed Alcohol condition only). Due to technical malfunction, there were missing cases from 25 time points in total: combining missing and partial data less than 5% of data were missing; Mixed Model analysis used the full information that was available.

Results

Sample Characteristics

Participants were young adults, highly educated (currently completing or completed tertiary qualifications), had high intellectual functioning level, low psychological distress level, comparable range of AUDIT score as compared to young adult population age from16-29 years (Bowring, Gouillou, Hellard, & Dietze, 2013), healthy BMI range and normal sleeping patterns (Table 5). Two participants reported occasional tobacco use (fortnightly).

Table 5

Participants Demographic Characteristics (N = 27)

Sample Characteristic	**Mean (*SD*)**	**Range**
Age (years)	22.8 (4.2)	18.0-34.0
BMI[a]	23.7 (3.0)	19.0-30.0
Risk for alcohol dependence (AUDIT)[b]	8.8 (4.2)	2.0-20.0
General intellectual functioning (WTAR)[c]	113.3 (9.8)	87.0-127.0
Level of psychological distress (K-10)[d]	12.0 (3.1)	8.0-20.0
Alcohol Sensitivity (ASQ)[e]	7.3 (2.8)	3.3-14.8
Sleep patterns[f] (hours per weeknight)	8.0 (0.9)	7.0-10.0
(hours per weekend night)	8.3 (1.1)	6.0-10.0

Note. [a]A body mass index (BMI) within 18.5-24.9 is considered as healthy weight, and BMI > 25.0 is considered as overweight (Department of Health and Human, 2014). [b]The Alcohol Use Disorders Identification Test (AUDIT) has a total scores of 40 and scores ≥ 16 indicated of possible hazardous drinking and potential risk for

alcohol dependence (Babor, Higgins-Biddle, Saunders, & Monteiro, 2001). [c]The Wechsler Test of Adult Reading (WTAR) with standardised score ≥ 100 indicated higher intellectual functioning. [d]The Kessler Psychological Scale (K-10) > 25 indicated clinical level of psychological distress (Kessler et al., 2002). [e]The greater the score for the Alcohol Sensitivity Scale (ASQ) indicated lower alcohol sensitivity: greater perception of alcohol stimulation effects and lower perception of alcohol sedative effects (O'Niell, Sher, & Bartholow, 2002). [f]The National Sleep Foundation (2016) recommended that healthy adults require on average 7-9 hours sleep for normal functioning.

Participants reported moderate alcohol, ED and caffeine use (Table 6). Three-fifths (63%) of participant had reported risky drinking (consumed > 4 standard drinks) in the past month (NHMRC, 2009).)

Table 6

Self-Reported Patterns of Alcohol, Caffeine and ED Consumption

Consumption Pattern	Mean (SD)	Range
Alcohol (TLFB) (Past Month)		
Average standard alcohol intake per drinking day [a]	6.2 (4.9)	1.4-20.0
Maximum standard alcohol intake per drinking day [a]	10.3 (6.0)	2.0-20.0
Days alcohol consumed	7.7 (6.1)	1.0-26.0
Days alcohol consumed exceeded NHMRC guideline [b]	2.6 (2.4)	0.0-9.0
ED and Caffeine Intake (Past Month)		
Typical ED consumed per drinking day [c]	1.5 (1.2)	0-4.0
Maximum ED consumed per drinking day [c]	2.0 (1.3)	0.0-4.0
Caffeine intake in preceding week (mg)	240.0 (181.6)	15-673

Note. [a]Timeline Follow-Back (TLFB) *(Sobell & Sobell, 1992b)* responses were based on standard alcoholic drinks (one standard drink = 10g of alcohol). [b]The National Health and Medical Research Council (NHMRC, 2009) acute drinking guideline suggests that drinking more than 4 standard alcoholic drinks in a single occasion increase the acute alcohol related harm and risks. [c]The ED consumed was measure based on standard ED (1 standard ED = 250mL of ED containing 80mg of

caffeine). Eleven percent of participant had exceeded the ED daily recommendation (maximum 2 × 250mL standard EDs per/day).

Objective Intoxication Measures

Breath Alcohol Concentration (BrAC). Mixed models analysis of BrAC revealed significant main effects of Condition, Time, and Sex and interaction of Condition × Time (Table 7). However, these main effects and two-way interaction were subsumed by a significant three-way Sex × Condition × Time interaction. A follow up for simple interaction effects of Condition × Time for males and females were then conducted separately (Figure 3 and 4).

The simple interaction effects of Condition × Time for males suggested that participants in the AmED condition had significantly lower mean BrAC, with typically moderate-large magnitude effects at from 20-150 (excluding 40, 90) minutes compared to the alcohol condition ($p \leq .010$, $g > 0.413$) (Figure 3, Appendix A: Table 21). Examination of Figure 3 revealed that the alcohol ($M = 0.043\%$, $SD = .018$) and the AmED ($M = 0.038\%$, $SD = .016$) conditions ($g = 0.289$) BrAC peaked at the same time point, which was at 130 minutes (10 minutes after administration of fourth drink).

The simple interaction effects of Condition × Time for females also suggested that participants had significantly lower mean BrAC during the AmED condition (typically moderate-large magnitude effects) at 60, 100, 110, 130, 150-220 minutes compared to the alcohol condition ($p < .005$, $g > 0.463$) (Figure 4, Appendix A: Table 22). Figure 4 indicated that in the alcohol (130 minute, $M = 0.072\%$, $SD = .019$) and the AmED (140 minute, $M = 0.062\%$, $SD = .014$) condition ($g = 0.591$), participants BrAC peaked after administration of the fourth beverage. It was also

noticeable that females obtained a BrAC peak that was two times higher (Alcohol condition, $g = 0.223$ AmED condition, $g = 0.208$).

Table 7

The F-statistics for All Subjective Ratings Variables

Variable	Condition	Time	Sex	Session	Condition× Time	Condition × Sex	Sex × Time	Condition × Time ×Sex
BrAC	***F*(1,647) = 220, *p* < .001**	***F*(18,77) = 132.31, *p* < .001**	***F*(1,27) = 38.39, *p* < .001**	***F*(1,621) = 72.67 *p* < .001**	***F*(18,77) = 2.22 *p* = .009**	***F*(1,636) = 8.48 *p* = .004**	***F*(18,76) = 16.66 *p* < .001**	***F*(18,75) = 2.15 *p* = .011**
SES								
Intoxicated	*F*(1,734) = 47.10, *p* = .898	***F*(18,81) = 3.77, *p* <. 001**	*F*(1,28) = .02, *p = .898*	***F*(1,621) = 72.67, *p* < .001**	*F*(18,74) = 1.54, *p = .102*	***F*(1,670) = 4.84, *p = .028***	***F*(18,74) = 4.37, *p* < .001**	*F*(18,72) = .45, *p* = .971
Impaired	***F*(1,672) = 46.48, *p* < .001**	***F*(18,78) = 5.98, *p* < .001**	*F*(1,28.) = .00, *p* = .995	*F*(1,612) = .058, *p* = .810	***F*(18,77) = 1.93 *p* = .02**	*F*(1,636) = 1.21, *p* = .272	***F*(18,73) = 3.76, *p* < .001**	*F*(18,73) = .71 *p* = .793
Mentally Fatigued	***F*(1,635) = 64.43, *p* < .001**	***F*(18,74) = 7.37, *p* < .001**	*F*(1,32) = .14, *p* = .711	***F*(1,570) = 7.96, *p* = .005**	***F*(18,71) = 2.02, *p* = .020**	***F*(1,577) = 6.31, *p* = .012**	*F*(18,74) = .72, *p* = .780	*F*(18,69) = .68, *p* = .807
Legally Able to Drive	***F*(1,704) = 57.72, *p* < .001**	***F*(18,54) = 4.94, *p* < .001**	*F*(1,28) = 2.13, *p* = .155	***F*(1,676) = 8.51, *p* = .004**	*F*(18,45) = 1.59, *p* = .105	*F*(1,655) = 1.87, *p* = .172	***F*(18,46) = 3.13, *p* < .001**	*F*(18,47) = .28, *p* = .998
Stimulated	***F*(1,681) = 10.06 *p* = .002**	***F*(18,70) = 3.05, *p* < .001**	*F*(1,28) = 2.94, *p* = .097	***F*(1,655) = 64.61 *p* < .001**	*F*(6,68) = .87, *p* = .614	***F*(1,605) = 7.27, *p* = .007**	***F*(18,74) = 2.02, *p* = .018**	*F*(18,67) = .64, *p* = .858
Sedated	***F*(1,676) = 15.09, *p* < .001**	***F*(18,73) = 2.86, *p* = .001**	*F*(1,29) = .64, *p* = .432	*F*(1,495) = 1.27, *p* = .260	*F*(18,76) = 1.28, *p* = .228	*F*(1,617) = 2.93, *p* = .087	*F*(18,73) = 1.61 *p* = .079	*F*(18,76) = .87, *p* = .620

Variable	Condition	Time	Sex	Session	Condition× Time	Condition × Sex	Sex × Time	Condition × Time ×Sex
BAES								
Stimulated	***F*(1,283) = 11.16, *p* = .001**	***F*(6,80) = 8.52, *p* < .001**	*F*(1,28) = 3.65, *p* = .066	***F*(1,284) = 7.13, *p* = .008**	*F*(6,56) = .29, *p* = .941	*F*(1,266) = .93, *p* = .336	***F*(6,67) = 2.98, *p* = .012**	*F*(6,58) = .74, *p* = .621
Sedated	***F*(1,204) = 4.23, *p* = .041**	***F*(6,76) = 4.00, *p* = .002**	*F*(1,36) = .28, *p* = .598	***F*(1,154) = 14.53, *p* < .001**	*F*(6,66) = 1.78, *p* = .330	*F*(1,176) = 1.14, *p* = .286	*F*(6,66) = 1.39, *p* = .233	*F*(6,66) = 1.25, *p* = .292

Note. BrAC = Breath Alcohol Concentration, SES = Subjective Effects Scale, BAES = Biphasic Effects Scale. The SES and BAES measures includes BrAC as covariate.

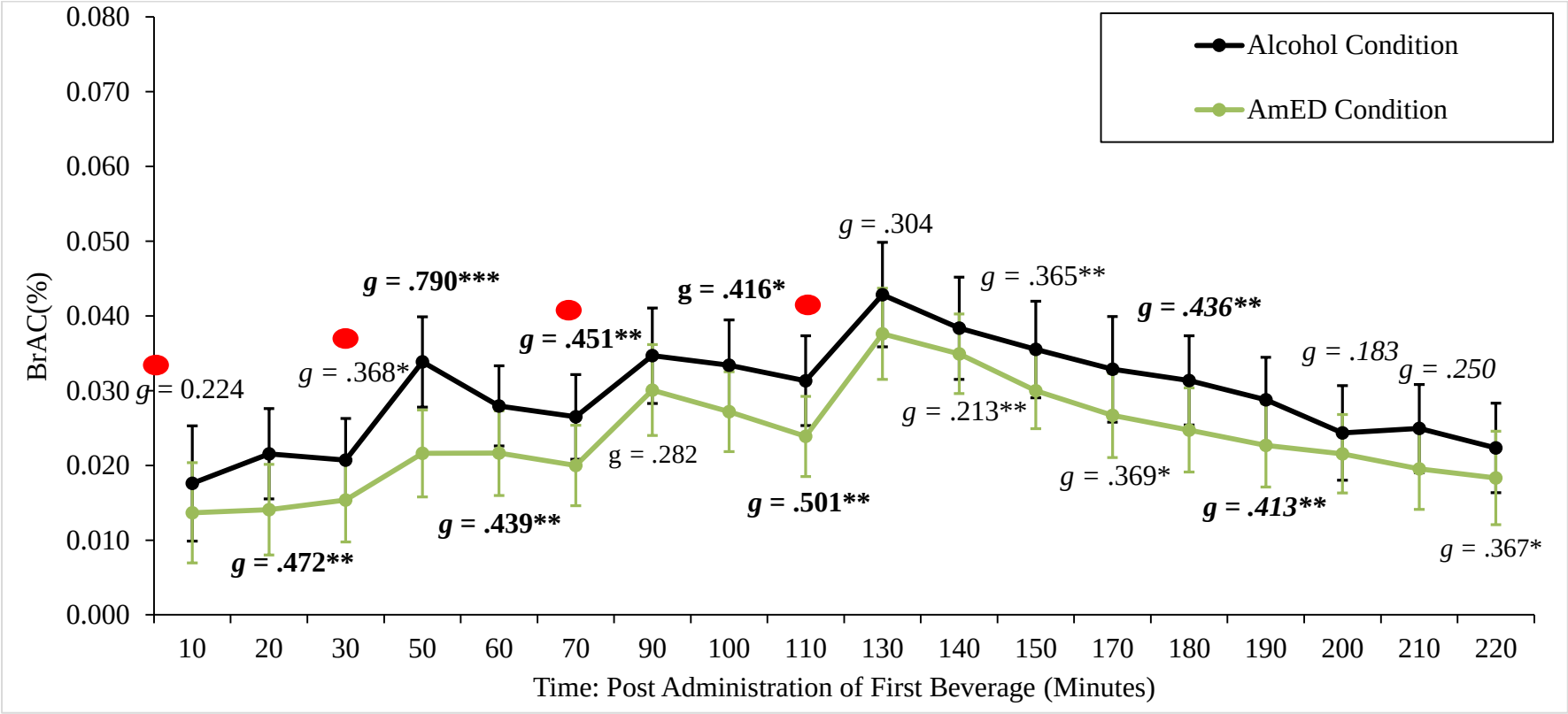

Figure 3. Breath alcohol concentration (BrAC) at each time-points for the Alcohol and the AmED Condition for males.

Note. *$p < .050$, **$p < .010$, ***$p < .001$. **BOLD =** $p < .05$, $g > 0.400$. Error bars represent 95% Confidence Intervals. The ● indicates beverage was administered.

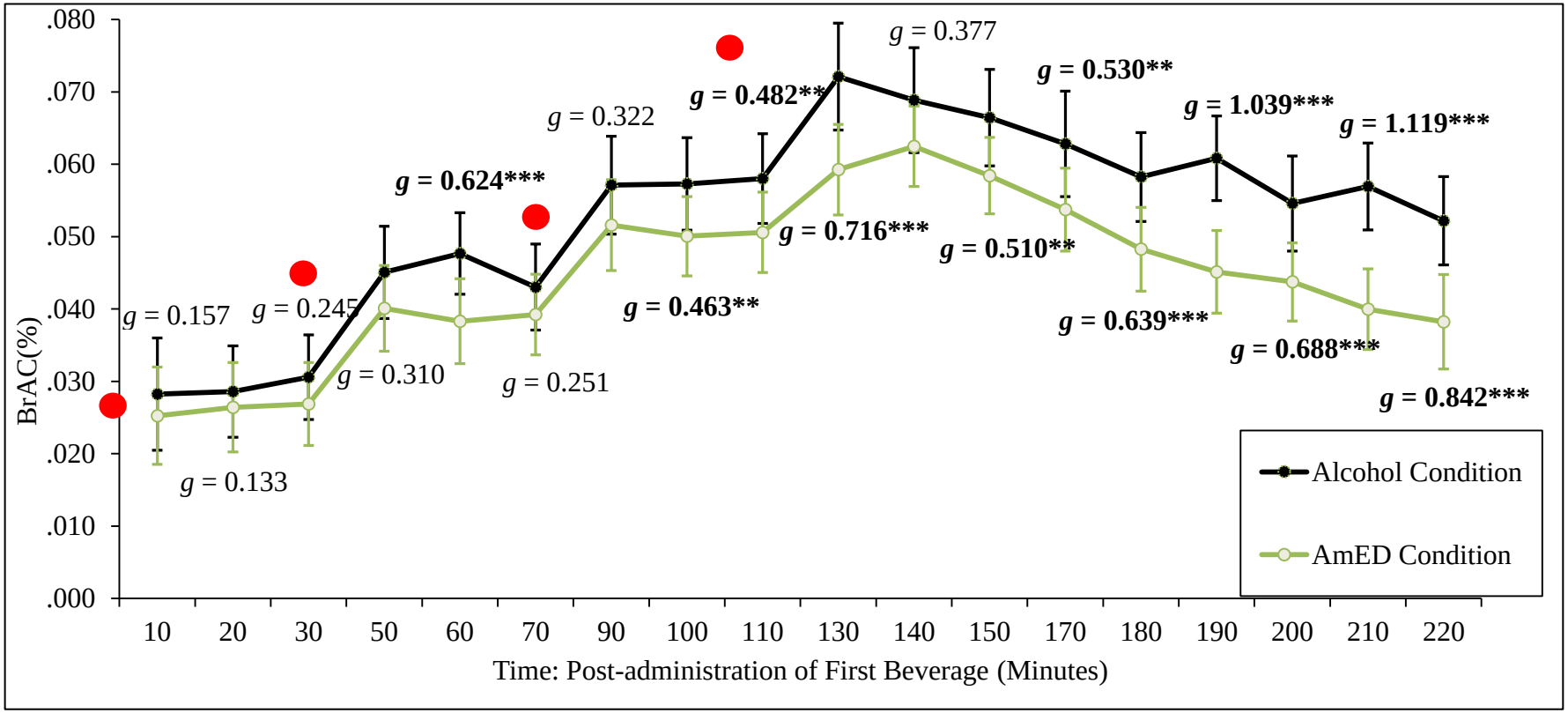

Figure 4. Breath alcohol concentration (BrAC) at each time-points for the Alcohol and the AmED Condition for females.

Note. *p < .050, **p <.010, ***p <.001. **BOLD =** $p < .05$, $g > 0.400$. Error bars represent 95% Confidence Intervals. The ● indicates beverage was administered.

Subjective Effects Scale

All subjective intoxication measures were controlled for the objective intoxication (BrAC) differences at each time point.

Feel Intoxicated. Analyses indicated a significant main effect of Time ($p < .001$), but no significant main effect of Condition ($p < .898$) or interaction of Condition × Time ($p < .102$) (Table 7). The intoxication ratings increased from 10-130 minutes, with highest ratings from 130-150 minutes, after which intoxication ratings decreased (Table 8). Pairwise comparisons revealed participants reported significantly lower intoxication ratings, with moderate magnitude effect ($p < .015$, $g > 0.422$) in the AmED condition compared to the alcohol condition from 60-150 minutes (excluding 70 and 140 minutes which were non-significant with small magnitude) (Figure 5, Appendix#: Table 23).

There was a significant Condition × Sex ($p = .004$) and Sex × Time interaction ($p < .001$). However, pairwise comparison revealed that there were no significant sex differences in intoxication ratings in both conditions ($p > .623$, $g < 0.049$) and across time-points ($p > .062$, $g < 0.517$), except for 180 minutes reaching significant with large magnitude (Table 9 and 10).

Table 8

The Mean and Standard Deviation of Subjective Intoxication Ratings across the Intoxication Curve

Time	*M*	*SD*
0 (Baseline)	4.43	26.99
10	17.64	23.04
20	21.01	21.09
30	20.97	20.25
50	24.12	19.69
60	28.45	20.66
70	23.65	19.53
90	29.94	19.86
100	29.16	19.49
110	28.01	19.99
130	32.89	20.24
140	32.54	21.06
150	32.77	20.47
170	28.85	19.89
180	31.84	21.04
190	28.13	20.36
200	23.71	19.89
210	22.09	19.83
220	19.36	19.67

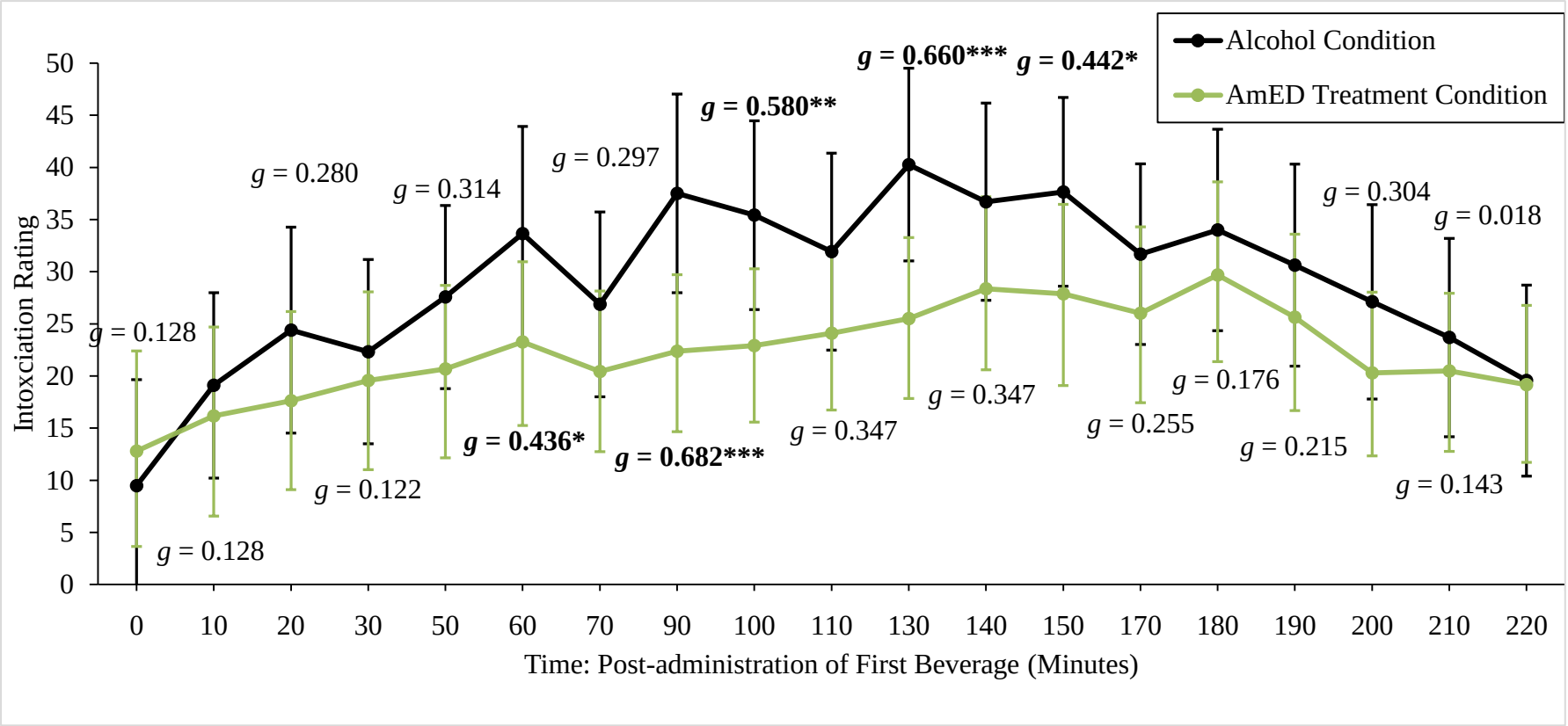

Figure 5. Ratings of feeling intoxicated at each time-point for the Alcohol and the AmED Conditions after controlling for BrAC.

Note. **p* < .050, ***p* <.010, ****p* <.001. **BOLD =** *p* < *.05, g* > 0.400. Error bars represent 95% Confidence Intervals. 'Feel intoxicated' rating was rated on a visual analogue scale ranging from 0 (not at all) to 100 (extremely).

Table 9

The Pairwise Comparison for Subjective Variables Between Sex at Each Level of Treatment Condition

Condition	Male		Female		Sig. Value (*p*)	Effect Size (*g*)
	M	*SD*	*M*	*SD*		
Intoxication						
Alcohol	26.91	24.11	30.12	25.84	.623	0.049
AmED	22.30	24.03	21.68	25.30	.928	0.025
Mental Fatigue						
Alcohol	19.53	12.04	20.61	13.02	.758	0.085
AmED	14.40	11.85	11.27	12.11	.352	0.257
Stimulation						
Alcohol	29.58	29.74	41.80	31.811	.157	0.391
AmED	30.31	30.05	48.52	31.66	**.039***	**0.580**

Note. * $p < .050$. **BOLD** = $p < .05$, $g > 0.400$.

Table 10

The Pairwise Comparison of Intoxication Rating between Sex at Each Time Point

Time	Male		Female		Sig Value (*p-Value)*	Effect Size (*g*)
	M	*SD*	*M*	*SD*		
0	13.62	30.17	7.70	30.51	.453	0.192
10	22.32	27.60	12.54	28.50	.202	0.344
20	25.03	28.45	16.53	29.84	.286	0.287
30	25.28	27.48	16.18	28.43	.235	0.321
50	27.62	26.59	20.08	28.17	.319	0.272
60	32.86	28.13	23.55	29.61	.244	0.318
70	24.86	26.55	21.96	27.93	.699	0.105
90	29.74	26.56	29.56	28.81	.981	0.007
100	29.55	26.13	28.19	28.24	.856	0.049
110	28.82	27.00	26.61	29.03	.776	0.077
130	29.78	26.3	35.32	29.47	.466	0.196
140	30.10	27.79	34.33	30.7	.597	0.142
150	29.03	27.28	35.90	29.90	.384	0.236
170	23.81	26.78	33.31	28.90	.220	0.336
180	22.35	28.57	40.78	30.44	**.027***	**0.615**
190	20.35	27.66	35.36	29.49	.062	0.517^
200	18.09	27.07	28.44	28.67	.184	0.366
210	17.98	27.19	25.67	28.48	.320	0.272
220	16.24	26.99	21.95	28.11	.454	0.204

Note. * $p < .050$. **BOLD =** $p < .05$, $g > 0.400$.

Feel Impaired. There were significant main effects of Condition ($p < .001$), Time ($p < .001$) and a Condition × Time ($p = .025$) interaction (Table 7). Pairwise comparisons for the interaction revealed there were significant, moderate-large magnitude decreases in impairment ratings in the AmED condition ($p < .038$, $g > 0.371$) from 20-150 minutes, excluding 30 and 140 minutes which were non-significant and had small magnitude (Figure 6, Appendix#: Table 23).

There was a significant interaction of Sex × Time ($p < .001$). However, there were no significant sex differences in impairment ratings across time points ($p > .162$, $g < 0.365$), except at 190 minutes (Table 11).

Mental Fatigue. A significant main effect of Condition ($p < .001$), Time ($p <. 001$) and interaction of Condition × Time ($p < .020$) were found (Table 7). Pairwise comparison (Figure 7, Appendix#: Table 23) revealed that there were significant, moderate-large magnitudes ($p < .046$, $g > 0.504$) decreases in mental fatigue ratings in the AmED condition after administration of second beverage from 50-190 minutes, (excluding 70 minutes).

There was a significant Condition × Sex interaction ($p = .012$). However, pairwise comparisons revealed no significant differences between male and female mental fatigue ratings in either treatment conditions ($p > .352$, $g < 0.257$) (Table 9).

Table 11

The Pairwise Comparison of Impairment Rating between Sex at Each Time Point

Time	Male		Female		Sig Value (*p-Value)*	Effect Size (*g*)
	M	*SD*	*M*	*SD*		
0	7.76	24.55	7.67	25.36	.988	0.004
10	15.71	27.60	24.46	6.50	.177	0.365
20	19.3	24.31	10.37	25.86	.194	0.350
30	16.8	21.96	11.97	23.10	.432	0.211
50	21.59	22.39	13.48	23.93	.207	0.345
60	27.69	22.82	19.55	24.00	.209	0.343
70	21.08	22.05	18.23	23.30	.648	0.124
90	23.25	23.67	22.09	25.67	.865	0.046
100	23.12	23.21	25.66	25.21	.703	0.103
110	21.25	22.90	21.12	24.58	.984	0.005
130	23.16	22.90	27.22	25.65	.539	0.164
140	25.82	23.81	24.44	26.36	.840	0.054
150	24.19	23.28	28.74	25.44	.497	0.184
170	17.99	21.65	24.89	23.53	.272	0.301
180	20.86	23.05	30.17	24.82	.162	0.383
190	15.88	22.95	29.20	24.85	**.048**	**0.549**
200	15.53	22.30	21.67	23.85	.337	0.262
210	14.07	22.34	18.71	23.80	.467	0.198
220	11.14	21.06	15.79	22.36	.439	0.211

Note. * $p < .050$. **BOLD =** $p < .05$, $g > 0.400$.

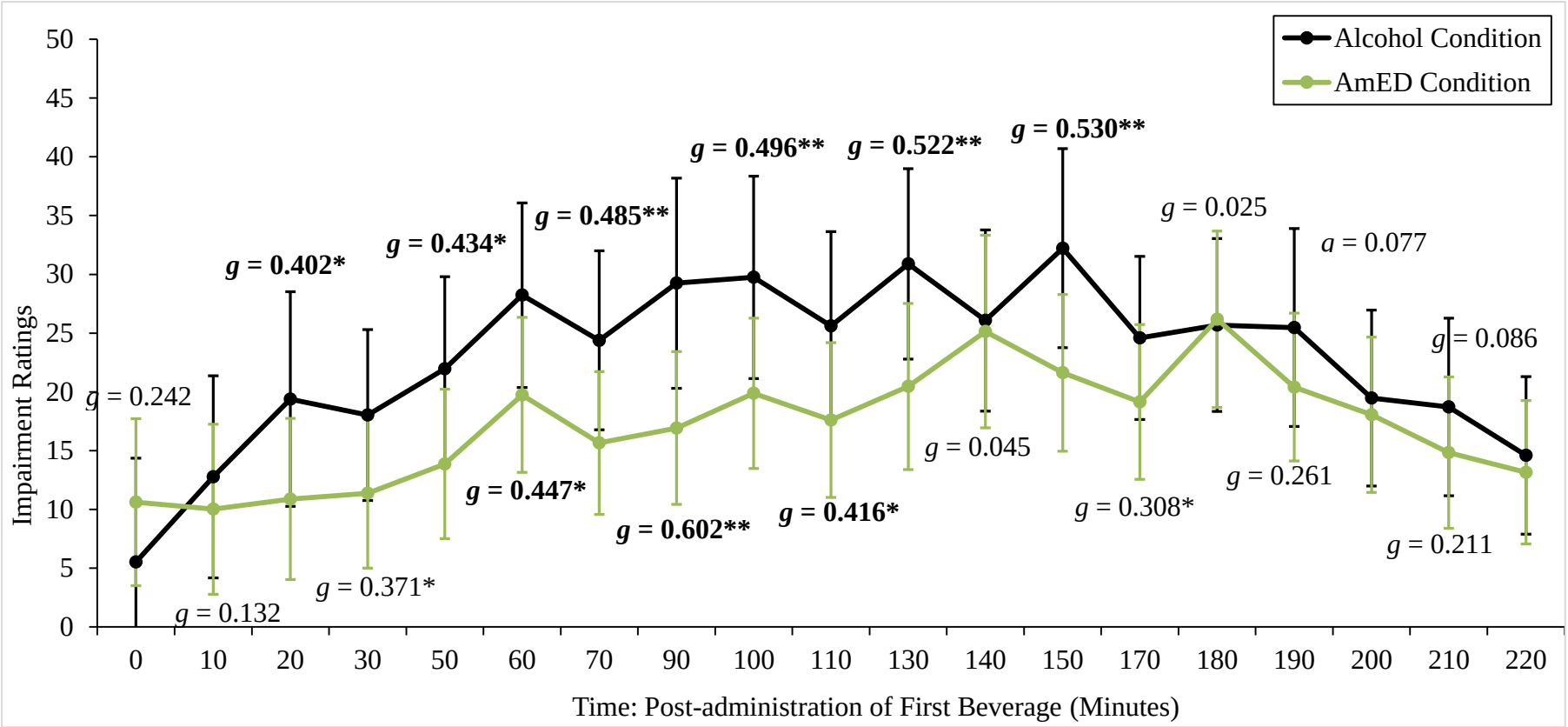

Figure 6. Ratings of feeling impaired at each time-point for the Alcohol and the AmED Conditions after controlling for BrAC.

Note. *p < .050, **p <.010, ***p <.001. **BOLD =** p < .05, g > 0.400. Error bars represent 95% Confidence Intervals. 'Feel impaired' rating was rated on a visual analogue scale ranging from 0 (not at all) to 100 (extremely).

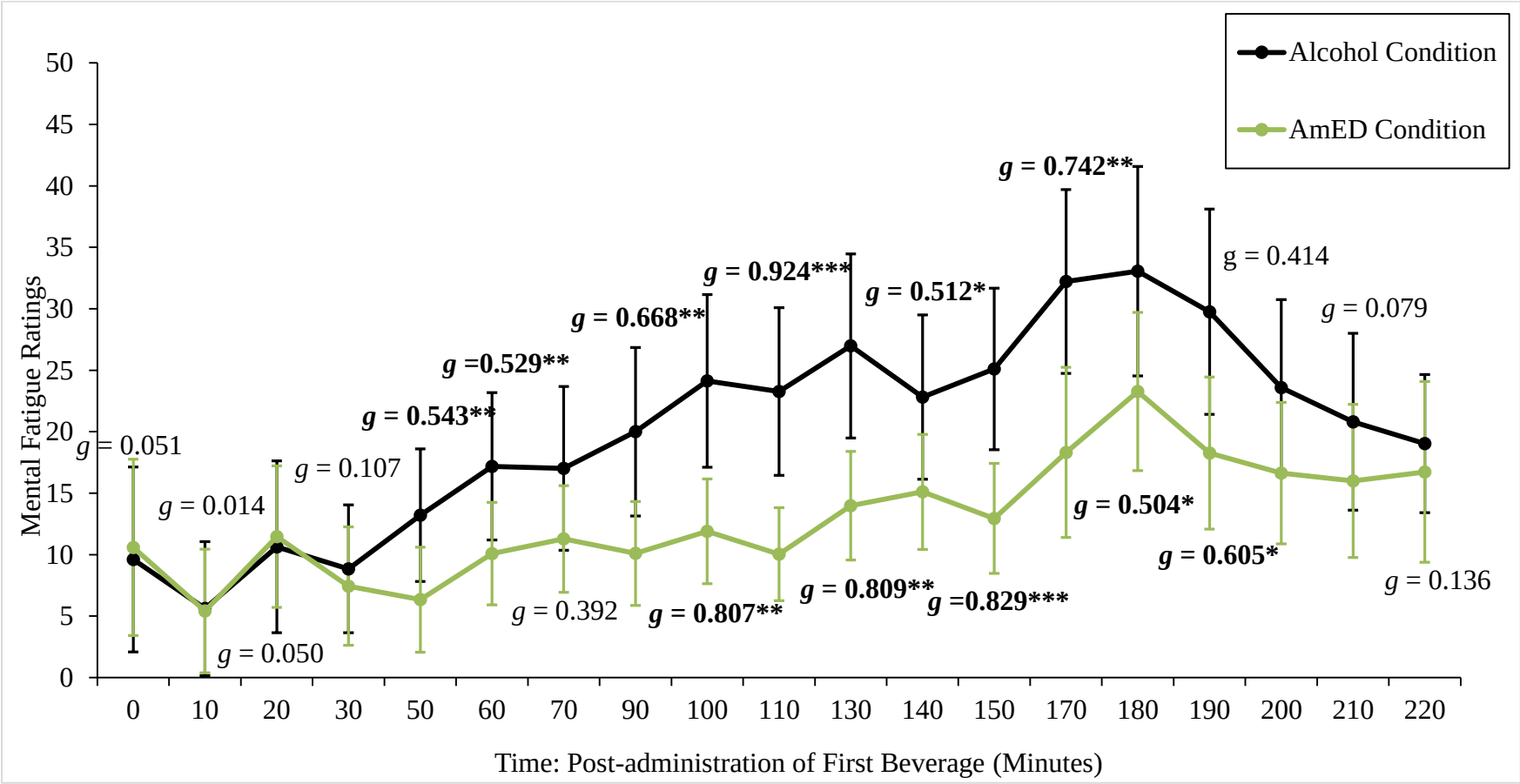

Figure 7. *Ratings of feeling mentally fatigued at each-time points for the Alcohol and the AmED Conditions after controlling for BrAC.*

Note. **p* < .050, ***p* <.010, ****p* <.001. **BOLD =** *p* < *.05*, *g* > 0.400. Error bars represent 95% Confidence Intervals. 'Feel mentally fatigued' rating was rated on a visual analogue scale ranging from 0 (not at all) to 100 (extremely).

Feel Legally Able to Drive. Significant main effect of Condition ($p < .001$) and Time ($p < .001$) were found, however there was no Condition × Time interaction ($p = .105$). During the AmED condition ($M = 59.7$, $SD = 29.3$), participants had significantly higher ratings of feeling legally able to drive as compared to the alcohol alone ($M = 47.5$, $SD = 29.6$) condition ($g = 0.408$). Regardless of treatment conditions, participants' ability to drive ratings decreases from 0-150 minutes and then increases from 170-220 minutes (Table 12). Despite a non-significant interaction, pairwise comparisons revealed that during the AmED condition, participants had significant, moderate-large magnitude increases in ratings of their ability to drive from 50-170 minutes ($p < .013$, $g > 0.418$) compared to the alcohol condition (Figure 8, Appendix#: Table 23).

There was a significant Sex × Time interaction ($p < .001$). Interestingly, after controlling for BrAC, males had consistently rated higher on being able to legally to drive compared to females across the intoxication curve, this effect had significant, moderate-large magnitude difference between 170-220 minutes ($p < .023$, $g > 0.638$) (Table 13).

Feel Stimulated. There were significant main effects of Condition ($p = .002$) and Time ($p < .001$), however there was no significant Condition × Time interaction ($p = .614$). Overall, participants in the AmED condition ($M = 36.0$, $SD = 22.1$) had significantly higher stimulation ratings as compared to the alcohol ($M = 39.7$, $SD = 22.2$) condition, ($g = 0.165$). However, the stimulation ratings were fairly consistent across time points (Table 14). Pairwise comparison also revealed that the magnitude of differences between conditions on ratings of stimulation were trivial-small ($p > .063$, $g < 0.344$), except at 210 minutes where a significant moderate magnitude effect was observed (Figure 9, Appendix#: Table 23).

There was a significant interaction of Sex × Condition (p = .007) and Sex × Time (p = .018). In the AmED condition, females had significantly higher ratings of stimulation compared to males, however there were no significant differences between Sex in the alcohol alone condition (Table 9). Across the intoxication curve, females typically reported higher stimulation ratings compared to males, with significant moderate-magnitude differences being evidenced from 100-180 minutes (p < .44, g > 0.560) (Table 15).

Feel Sedated. There was a significant main effect of Condition (p < .001) and Time (p< .001), however there was no significant of Condition × Time interaction (p = .228). Overall, participants in the AmED condition (M = 13.4, SD = 11.0) had significantly lower sedation ratings compared to the alcohol condition (M = 16.9, SD = 11.1) (g = 0.306). Regardless of the Condition, sedation ratings increase across the intoxication curve and started to decrease from 200 minute (Table 16). Pairwise comparisons (Figure 10, Appendix#: Table 23) revealed a trivial-small (p > .064, g < 0.327) magnitude differences of sedation ratings between both conditions at all time points, except for 110 and 200 minutes, reaching significance with moderate-large magnitudes.

Table 12

The Mean and Standard Deviation of Legally Able to Drive Ratings across the Intoxication Curve

Time	*M*	*SD*
0 (Baseline)	86.44	38.67
10	64.93	35.96
20	62.80	64.73
30	64.18	33.90
50	53.45	32.66
60	49.86	32.68
70	50.29	31.80
90	45.96	32.68
100	44.22	32.21
110	45.27	31.70
130	42.24	33.00
140	41.17	32.32
150	43.55	32.21
170	50.63	5.977
180	49.91	31.14
190	52.74	31.88
200	54.71	31.72
210	57.25	31.35
220	59.06	31.48

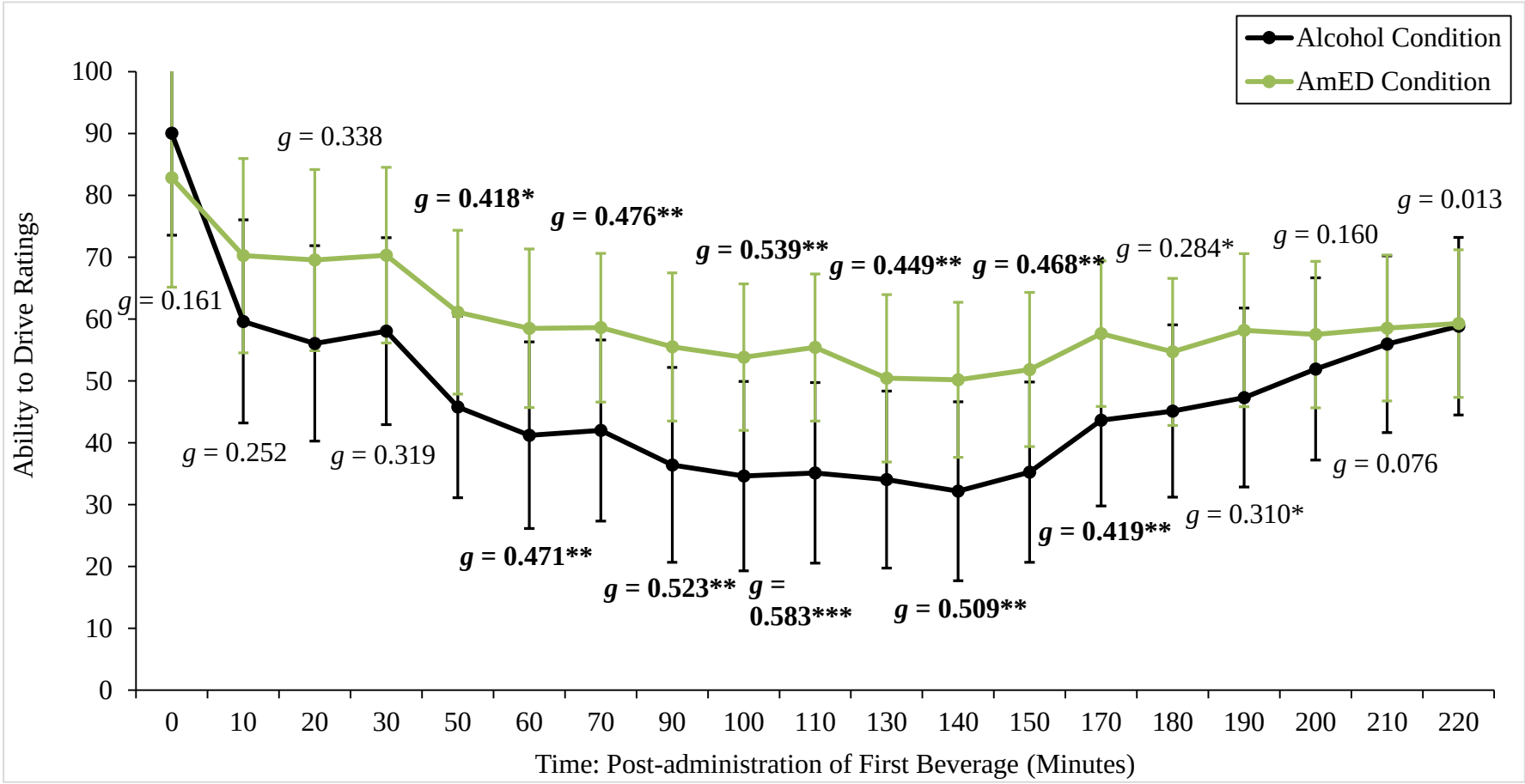

Figure 8. Ratings of feeling legally able to drive at each time points for the Alcohol and the AmED Conditions after controlling for BrAC.

Note. **p* < .050, ***p* <.010, ****p* <.001. **BOLD =** *p* < *.05*, *g* > 0.400. Error bars represent 95% Confidence Intervals. 'Legally able to drive' rating was rated on a visual analogue scale ranging from 0 (not at all) to 100 (extremely).

Table 13

The Pairwise Comparison of Legally Ability to Drive between Sex at Each Time Point

Time	Male		Female		Sig Value (*p-Value)*	Effect Size (*g*)
	M	*SD*	*M*	*SD*		
0	86.59	51.31	88.82	53.52	.871	0.042
10	69.71	48.40	61.40	9.87	.541	0.164
20	66.45	46.08	60.34	49.93	.641	0.125
30	67.94	45.36	61.65	48.37	.622	0.132
50	58.79	43.64	49.53	47.21	.459	0.201
60	54.28	43.91	46.85	47.06	.553	0.161
70	61.5	42.64	40.52	45.64	.089	0.468^{+}
90	55.25	43.44	38.27	47.39	.178	0.368
100	53.74	42.85	36.28	46.65	.161	0.384
110	53.88	42.34	38.22	45.96	.203	0.349
130	50.49	43.11	35.69	47.88	.236	0.320
140	50.48	42.25	33.55	47.09	.171	0.373
150	54.35	42.55	34.39	49.99	.110	0.439^{+}
170	67.56	41.25	35.28	8.69	**.010***	**0.736**
180	67.27	41.52	34.10	45.11	**.008****	**0.754**
190	68.32	42.58	38.62	46.35	**.019***	**0.658**
200	69.52	42.69	40.86	45.77	**.023***	**0.638**
210	72.31	42.30	43.59	45.05	**.021***	**0.648**
220	74.49	42.48	45.05	45.16	**.019***	**0.662**

Note. * $p < .050$, ** $p < .010$. **BOLD =** $p < .05$, $g > 0.400$. + = Comparisons did not reach significant level ($p > .05$, $g > 0.400$, indicating moderate effect).

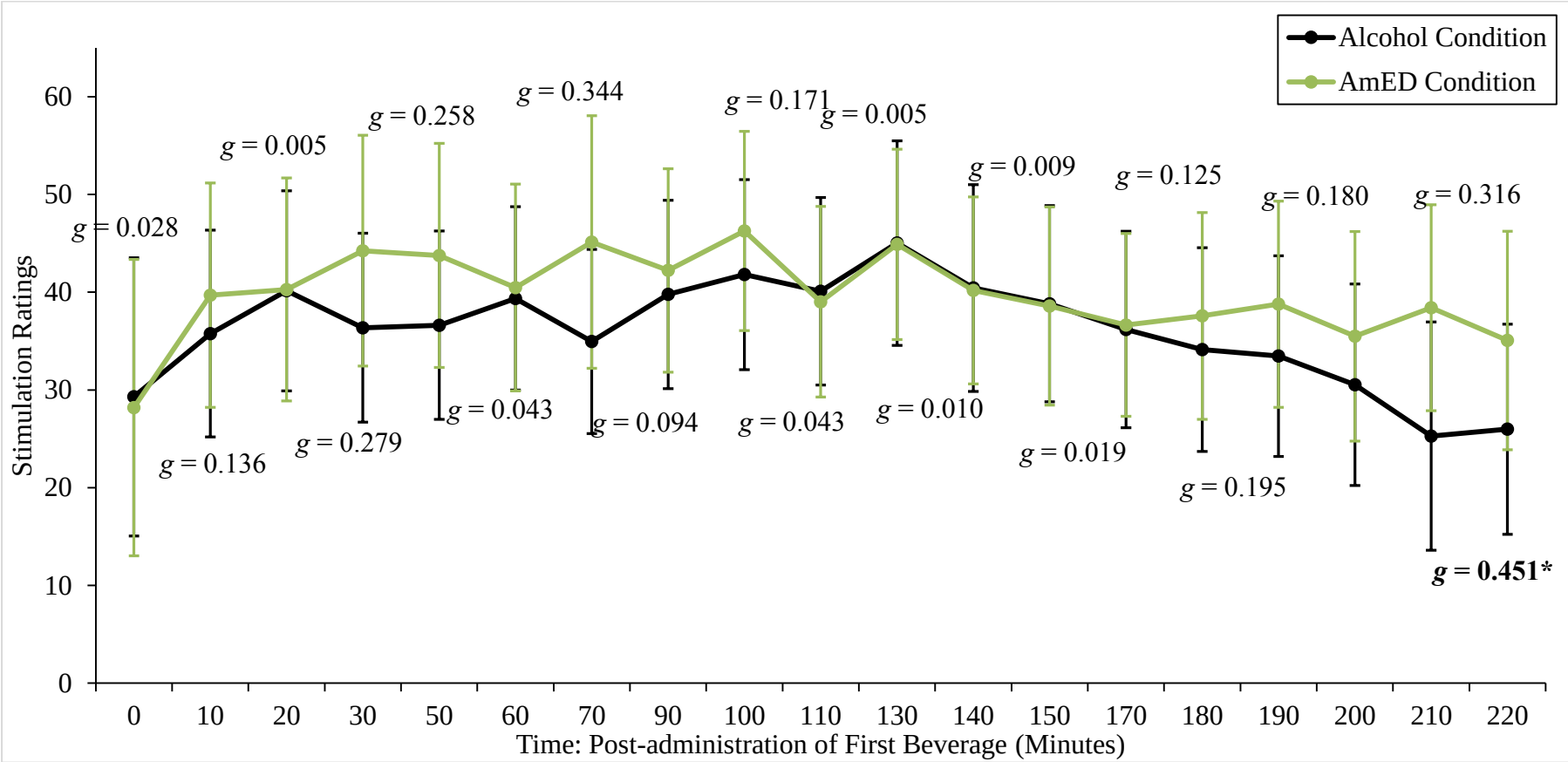

Figure 9. Ratings of feeling stimulated at each time-point for the Alcohol and the AmED Treatment Conditions after controlling for BrAC.

Note. *$p < .050$. **BOLD** = $p < .05$, $g > 0.400$. Error bars represent 95% Confidence Intervals. 'Feel stimulated' rating was rated on a visual analogue scale ranging from 0 (not at all) to 100 (extremely).

Table 14

The Mean and Standard Deviation of SES: Stimulative Ratings across the Intoxication Curve

Time	*M*	*SD*
0 (Baseline)	28.74	32.14
10	37.74	25.51
20	40.21	25.25
30	40.31	25.13
50	40.20	23.27
60	39.92	23.80
70	40.05	25.71
90	41.00	23.95
100	44.03	23.84
110	39.57	23.38
130	44.96	24.35
140	40.31	24.26
150	38.70	24.14
170	36.42	23.46
180	35.85	24.59
190	36.12	24.39
200	33.01	24.57
210	31.85	25.44
220	30.53	25.22

Table 15

The Pairwise Comparison of SES: Stimulation between Sex at Each Time Point

Time	Male		Female		Sig Value (*p-Value)*	Effect Size (*g*)
	M	*SD*	*M*	*SD*		
0	28.41	43.24	29.12	43.86	.950	0.016
10	30.52	34.45	44.39	36.18	.153	0.387
20	31.25	33.97	48.61	35.80	.072	0.490^
30	33.13	33.99	46.92	35.55	.150	0.391
50	31.25	33.38	48.49	35.43	.073	0.494+
60	29.79	32.25	49.41	34.14	.037	0.582^
70	34.34	34.82	45.13	37.01	.277	0.296
90	32.40	32.16	48.94	34.59	.077	0.488+
100	34.23	32.00	53.16	34.56	**.044***	**0.560**
110	27.58	31.48	50.87	33.92	**.013***	**0.702**
130	34.12	31.86	55.06	35.34	**.026***	**0.613**
140	27.93	32.00	51.98	35.22	**.012***	**0.705**
150	28.14	32.09	48.56	35.29	**.032***	**0.597**
170	26.11	31.43	46.04	34.17	**.033***	**0.598**
180	24.81	33.22	46.23	35.65	**.028***	**0.613**
190	28.9	32.92	45.65	35.44	.150	0.396
200	28.13	33.36	36.94	35.53	.357	0.252
210	28.91	34.75	34.15	36.61	.595	0.145
220	29.06	34.70	31.40	6.92	.810	0.065

Note. * $p < .050$. **BOLD =** $p < .05$, $g > 0.400$. + = Comparisons did not reach significant level ($p > .05$, $g > 0.500$, indicating moderate effect). ^ = Comparisons did not reach significant level ($p > .05$, $g > 0.500$, indicating large effect).

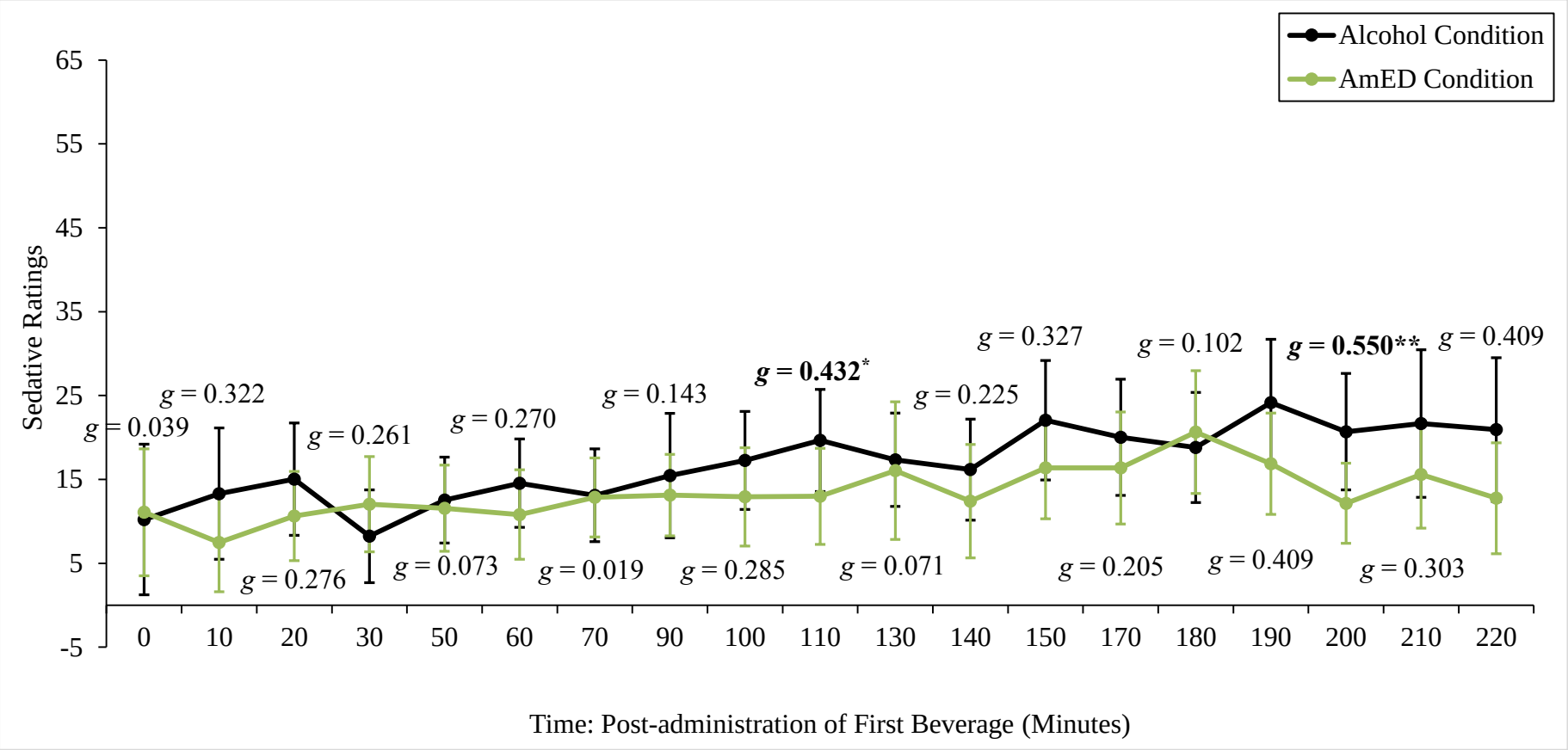

Figure 10. Ratings of Feeling Sedated at Each Time points for the Alcohol and the AmED Conditions after controlling for BrAC.

Note. **p* < .050. ***p* < .010. **BOLD =** *p* < *.05*, *g* > 0.400. Error bars represent 95% Confidence Intervals. 'Feel sedated' rating was rated on a visual analogue scale ranging from 0 (not at all) to 100 (extremely).

Table 16

The Mean and Standard Deviation of SES: Sedative Ratings across the Intoxication Curve

Time	*M*	*SD*
0 (Baseline)	10.65	18.02
10	10.39	14.85
20	12.83	13.54
30	10.14	12.89
50	12.05	11.99
60	12.68	12.24
70	12.98	12.01
90	14.30	13.72
100	15.09	13.09
110	16.32	13.16
130	16.69	15.12
140	14.29	14.14
150	19.22	14.40
170	18.19	14.54
180	19.73	14.71
190	20.51	14.54
200	16.42	13.20
210	18.62	15.85
220	16.85	15.80

Biphasic Alcohol Effects Scale (BAES)

Stimulation. There were significant main effects of Condition ($p < .001$) and Time ($p < .001$). However, no statistically significant Condition × Time ($p = .941$) interaction was found. There was a significantly higher rating of stimulation in the AmED condition ($M = 24.6$, $SD = 22.1$) compared to the Alcohol condition ($M = 21.5$, $SD = 22.8$) ($g = 0.136$). The follow up for the main effect of Time indicated that the stimulation ratings were relatively constant across time points (Table 17). Pairwise comparison revealed trivial-small magnitude ($p > .037$ $g < 0.278$) stimulation difference between conditions across all time points (Figure 11, Appendix#: Table 23).

There was also a significant Sex × Time interaction ($p = 0.12$), there was a large magnitude effect, whereby females reported significantly higher simulation ($p < .038$ $g > 0.582$) from 60-80 minutes in comparison to males (Table 18).

Sedation. There were main effects of Condition ($p = .41$) and Time ($p = .002$) however, no significant interaction of Condition × Time ($p = .330$) was found. In the AmED condition ($M = 9.9$, $SD = 6.0$), participants had significantly lower sedation rating compared to Alcohol alone condition ($M = 11.7$, $SD = 6.5$), ($g = 0.283$). Regardless of Condition, sedative ratings increased from 0-100 minutes and decreased from 140-210 minutes (Table 17). Pairwise comparison revealed that the magnitudes of sedation ratings differences between Conditions were trivial-small ($p > .115$, $g < 0.202$), except at 100 minutes, where a significant moderate effect was evidenced (Figure 12, Appendix#: Table 23).

Table 17

The Mean and Standard Deviation of BAES: Stimulation and Sedation across the Intoxication Curve

Time	*M*	*SD*
Stimulation		
0	17.59	18.42
20	25.80	15.36
60	25.62	15.09
100	26.34	15.38
140	26.09	15.85
180	20.90	15.32
210	18.82	15.50
Sedation		
0	7.04	10.04
20	7.57	6.48
60	9.57	7.05
100	11.45	7.73
140	13.97	10.00
180	14.91	9.61
210	11.08	8.77

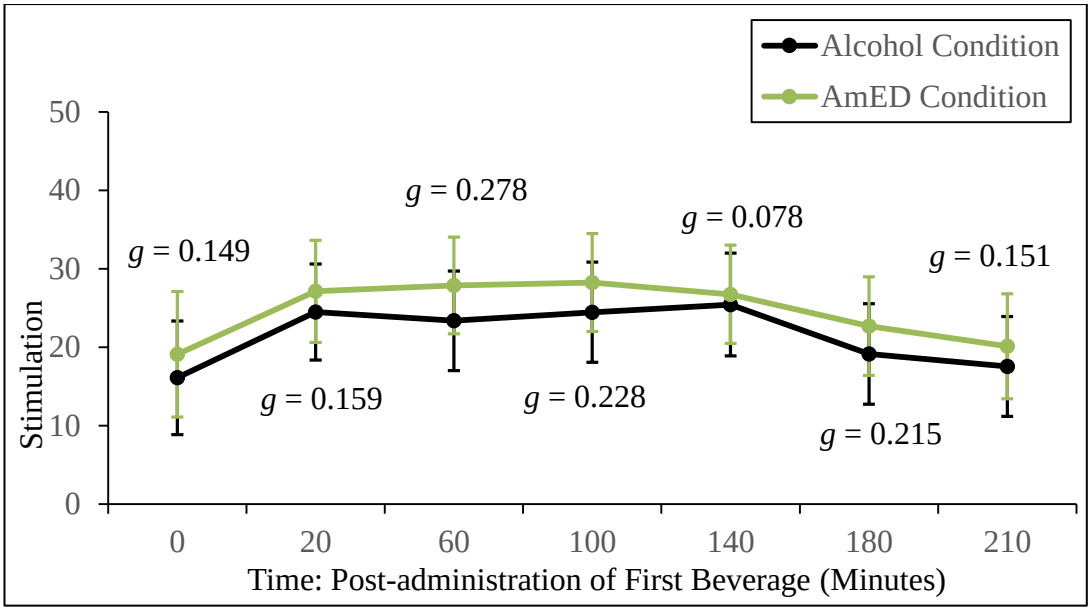

Figure 11. Ratings of Stimulation at Each Time points for the Alcohol and the AmED Conditions after controlling for the BrAC.

Note. Error bars represent 95% Confidence Intervals. Seven items on the Simulation sub-scale of BAES were rated on a 10 points Scale, ranging from 0 (not at all) to 10 (extremely). The total score of the Stimulation sub-scale: 0-70.

Table 18

The Pairwise Comparison of BAES: Stimulation between Sex at Each Time Point

Time	Male		Female		Sig Value (*p-Value)*	Effect Size (*g*)
	M	*SD*	*M*	*SD*		
0	14.20	23.90	21.01	24.80	.274	0.276
20	22.97	21.28	28.64	21.79	.336	0.259
60	19.28	20.94	31.97	22.02	**.038***	**0.582**
100	19.45	20.86	33.25	22.72	**.026***	**0.623**
140	19.00	20.66	33.19	23.46	**.022***	**0.633**
180	13.44	4.044	28.39	4.36	**.017***	**0.675**
210	15.54	21.69	22.13	22.69	.288	0.293

*Note. * p < .050.* **BOLD =** *p < .05, g* > 0.400.

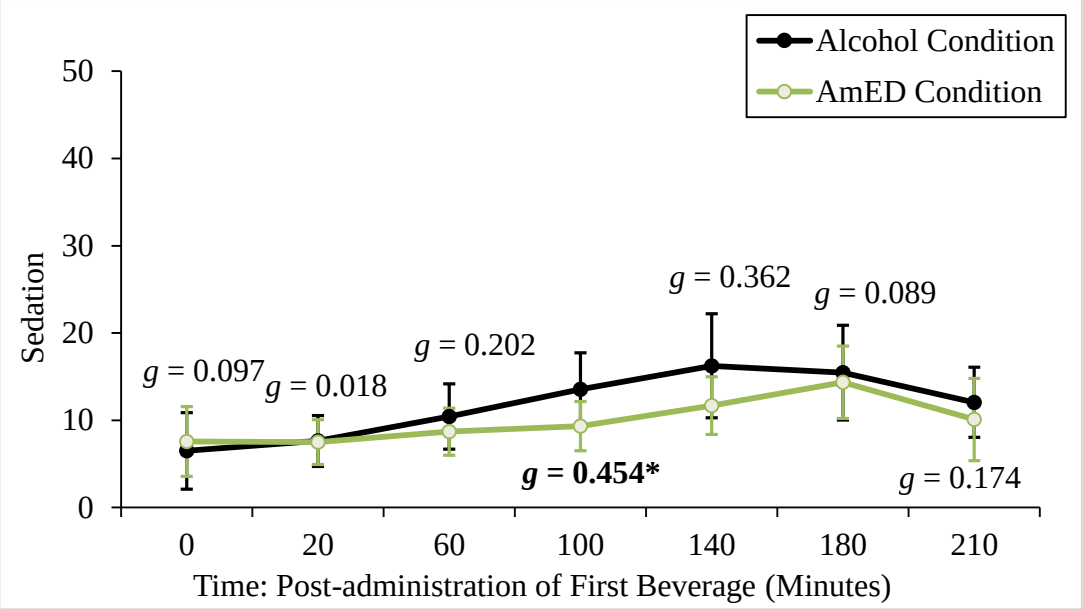

Figure 12. Ratings of Sedation at Each Time points for the Alcohol and AmED Conditions after controlling for the BrAC.

Note. * $p < .05$. **BOLD =** $p < .05$, $g > 0.400$. Error bars represent 95% Confidence Intervals. Seven items on the Sedation sub-scale of BAES were rated on a 10 points Scale, ranging from 0 (not at all) to 10 (extremely). The total score of the Sedation sub-scale: 0-70.

Bivariate Correlations

Bivariate and partial correlations analysis between stimulation/sedation and subjective/objective intoxication were conducted to examine whether they were predictors of each other. Bivariate correlations (Table 19) for the Alcohol Condition, revealed that subjective intoxication correlation was moderately correlated with objective intoxication (BrAC; $r = 0.43$); in the AmED Condition this was reduced ($r = 0.31$).

In the Alcohol condition, subjective stimulation and sedation ratings were strongly correlated with subjective intoxication ($r \geq 0.49$), but less related to objective measure ($r \leq 0.30$). Under AmED Condition, these correlations were all

reduced, falling to small correlations with subjective intoxication ($r \leq .27$) and negligible relationships with objective intoxication ($r \leq .03$).

The partial correlation (Table 20) revealed that after controlling for BrAC, stimulation and sedation ratings were moderately correlated with subjective intoxication in the Alcohol Condition ($r = 0.45$). However, these correlations were reduced in AmED condition ($r < 0$ .30). After controlling for the subjective intoxication, stimulation and sedation ratings had near zero-correlation with the objective measure in both the Alcohol ($r < 0.12$) and the AmED ($r < .09$) condition.

Table 19

The Correlation between Objective and Subjective Measures

Measures	BrAC	Subjective Intoxication	Stimulation	Sedation
BrAC	-	.31	-.03	.13
Subjective Intoxication	.43*	-	.27	.32
Stimulation	.20	.49**	-	-.02
Sedation	.30	.52**	.12	-

Note. BAES: Stimulation and Sedation. * $p < .05$, ** $p < .01$. Correlations in the Alcohol Condition on lower diagonal; correlations in the AmED Condition on upper diagonal.

Table 20

The Correlation between Objective and Subjective Intoxication Measures for AmED Treatment Condition

Control for BrAC			
Measures	Subjective Intoxication	Stimulation	Sedation
Subjective Intoxication	-	.29	.30
Stimulation	.45	-	-.02
Sedation	.45	.06	-
Control for Subjective Intoxication			
Measures	BrAC	Stimulation	Sedation
BrAC	-	-.12	.03
Stimulation	-.01	-	-.12
Sedation	.09	-.18	-

Note. BAES: Stimulation and Sedation. Correlations in the Alcohol Condition on lower diagonal; correlations in the AmED Condition on upper diagonal.

BRS: Manipulation Check

The Mixed Model Analysis revealed no statistical main effect of Condition, $F(1,142) = .06$, $p = .812$. Participants perceived that they had consumed similar dosage of EDs in the AmED ($M = 2.0$, $SD = 0.7$) and the Alcohol ($M = 2.0$, $SD = 0.7$) Conditions ($g = 0.019$) indicating successfully blinding participants to conditions.

Discussion

The aim of this study was to examine whether consuming AmED alters (1) objective intoxication (BrAC), (2) the intensity of subjective intoxication and (3) the nature of intoxication throughout the intoxication curve, when compared with consuming alcohol alone.

Interpretation of Results

Objective Intoxication (BrAC). Current findings supported the hypothesis, in that there was a significant, moderate-large magnitude reduction of BrAC across the intoxication curve for in both males and females. This finding consistent with previous literature suggesting that mixing moderate doses of alcohol with ED doses that matched the recommended daily intake (eg: 2 × 250mL of standard EDs/day) would lower BrAC as compared to administering alcohol only or with a low ED dose (eg: 1 standard ED) (Forward, 2015; Lubman et al., 2013; VanderNiet, 2014).

As the rate of gastric emptying is proportionate to energy density, the overall calorie/sugar content in the ED (54g of sugar = 234 Calories) mimics the presence of food in the stomach and thus slows gastric emptying rate. This results in attenuating the intestinal absorption of alcohol (Leiper, 2015; Lubman et al., 2013). Furthermore, delayed rate of gastric emptying prolongs gastric metabolism. The delayed of intestinal alcohol absorption would also optimise the liver metabolism, hence reducing the bioavailability of alcohol, and leading to a lower concentration of alcohol within the blood stream (Cederbaum, 2012; Oneta et al., 1998). In short, sugar may be the main ingredient in ED that affects the absorption and metabolism rate of alcohol which then lead to a consistently lower of BrAC throughout the intoxication curve.

Additionally, the results also revealed sex difference in BrAC, where females had a mean BrAC that was two times higher, as well as longer persistence of BrAC on the descending intoxication limb, relative to males. Sex difference in BrAC are well established in the literature, and attributed to differences in body size, composition and metabolism rate (Mumenthaler, Talylor, O'Hara, & Yesavage, 1999). As alcohol is distributed in water, more body fat to body water volume and lesser body weight in females would increase the concentration of alcohol in the bloodstream. Females also have smaller rate of gastric metabolism due to the lesser capacity of gastric alcohol dehydrogenase to oxidise alcohol. Hence, a greater amount of alcohol reaches the blood stream for females (Sato et al., 2001). Such BrAC differences in females may results in different subjective alcohol drinking experience and alcohol-related behaviours. For example, higher BrAC in females may increase subjective intoxication and act as a protective factor preventing over consumption or involvement in risky drinking practices (Erol & Karpyak, 2015).

Subjective Measures

As discussed above, BrAC was significantly different between treatment conditions and across the intoxication curve. Analysis for all subjective measures controlled for BrAC to examine the genuine subjective effect of ED with alcohol instead of due to the BrAC difference.

***SES:Intoxication*.** Although there was no statistically significant Condition × Time interaction, there were moderate-large magnitude decreases in intoxication ratings in the AmED condition relative to alcohol condition, from 50 minutes post-consumption. The interval where participants perceived lower intoxication is consistent with the pharmacokinetics of caffeine, where caffeine reaches peak

concentration in bloodstream approximately 30 minutes post-consumption (Ferre, 2008).

As such, this study supports the idea of 'wide-awake drunkenness' effect, where AmED consumers perceive their intoxication as lower after AmED versus alcohol consumption (Arria & O'Brien, 2011). Current results were inconsistent with majority of previous literature who had administered a low dose of ED (e.g. one 250mL standard ED), where they found no difference in intoxication ratings between AmED and alcohol condition (Marczinski et al., 2012a; Marczinski, Fillmore, Henges, Ramsey, & Young, 2012b; Peacock et al., 2013). However, current findings were still consistent with those (Forward, 2015; Heinz et al., 2013; VanderNiet, 2014) that administered EDs that reflects the real-world consumption dosage (3 standard ED or caffeine equivalent). The current study supports the ED dose-dependent notion, where 'wide-awake drunkenness' would only be apparent after administering higher ED doses (Peacock et al., 2014).

SES: Impairment and Mental Fatigue. The ratings of impairment and mental fatigue reflecting the consequences of perceived intoxication. Consistent with the subjective intoxication ratings, during the AmED condition, participants had significantly, moderate-large decreases impairment ratings after AmED versus alcohol condition across the intoxication curve, from 20 minutes post-administration for impairment ratings and from 40 minutes post-administration for mental fatigue ratings. Current findings were consistent with Marczinski et al.'s (2012a) study and support the masking effect of ED. That is, ED reduced the intensity of depressant cues of alcohol and hence caused participants to perceive lower impairment and mental fatigued level during the AmED condition, and thus subjectively feeling less intoxicated (Arria & O'Brien, 2011). The findings are also consistent with the

pharmacological effect of caffeine, which induce alertness and decrease fatigue. Hence, results suggesting that caffeine may be the main driver that counteract the subjective impairments and fatigue of alcohol (Childs & de Wit, 2008; McKetin, Coen, & Kaye, 2015). Furthermore, such consistent reduction of the ratings in the AmED condition across the intoxication curve, is due to the long half-life (3-4 hours) of caffeine (Benowitz, 1990). This indicates that the effect of caffeine is at its' optimum during the experimental session.

SES:Legally Able to Drive. With consistently lower perception of intoxication, impairment and mental fatigue across the intoxication curve during the AmED condition, it is not surprising that the current study found that participants had moderate-large magnitude increases in perception of ability to drive in the AmED condition as compared to the alcohol condition from early ascending to descending intoxication limb. However, the current finding was not consistent with previous studies where they found no difference for this rating between the treatment conditions (Marczinski et al., 2012a; Peacock et al., 2012b). Again, this could be due to methodological differences where the current study improved ecological validity by administering larger ED dose that mimics the real-world drinking consumption. Therefore, this might be the dose threshold that manifests the impact of EDs in altering the intensity of subjective capability to drive (Peacock et al., 2014). Current findings were consistent with the 'wide-awake drunkenness' hypothesis, where AmED consumers perceived lower intoxication and lesser impairment cues, which may cause them to have greater tendency to engage in drink driving or risky behaviour in general (Quinn & Fromme, 2012).

Interestingly, the results showed that overall, males had moderate-large increases in ability to drive ratings compared to females from the mid-ascending

intoxication limb, despite controlling for BrAC differences. This finding is compatible with the general profile of drink drivers, where males are far more likely than females to drink drive (Simpson, Beirness, Robertson, Mayhew, & Hedlund, 2004). This may be due to the differential characteristic traits, where males have higher sensation seeking and impulsivity traits that increases their tendency to engage in risk-taking (Nolen-Hoeksema, 2004).

Stimulation and Sedation. The BAES subscales for the stimulation and sedation, were chosen to operationalise the nature of intoxication (Martin et al., 1993). In order to prevent fatigue effect by requiring participants to respond to the 14-items BAES (measuring at 7 different time points) every 10 minutes the SES: stimulation and sedation measures were administered instead, meaning that the BAES was measured at 7 different time-points and the SES scale at 19 time-points.

Researchers theorised that rather than altering the intensity of intoxication, ED would enhance the stimulative effect and diminish the sedative effect that primes AmED consumers to drink more (Marczinski et al., 2012a; Peacock et al., 2013). However, current findings for the SES and the BAES stimulation found no stimulation and sedation ratings difference with overall trivial-small magnitude differences between the treatment conditions at each time-point on the intoxication curve. Current findings were contrary to Marczinski et al. (2012a) ($g = .293$), Peacock et al. (2013) ($g = .496$) studies who found greater stimulation ratings after AmED condition on the ascending intoxication, and to VanderNiet (2014) study who found lower sedative ratings after AmED versus alcohol condition on the ascending limb and delayed stimulatory effect on the descending limb. VanderNeit (2014) suggested that such delayed stimulatory effect was due to delayed peak effects. However, the current study eliminates this explanation as effects of caffeine was

already apparent 30 minutes after first AmED beverage was given and participant perceived lower intoxication. Alternative explanation may be due to difference in beverage administration procedure, where the current study implemented the multi-dosing method and previous studies had administered the beverage bolus. When the beverage was given in a single dose in previous studies, the stimulatory effects may be greater when both ED and alcohol produce stimulatory effects. Such reasoning is due to the nature of alcohol, where alcohol can produce stimulation when alcohol concentration is low (BrAC < 0.05%) on the ascending intoxication limb (Holdstock & de Wit, 1998) and a moderate dose (80mg) of caffeine in the ED is also enough to produce stimulatory effects (Yunusa & Ahmad, 2012). This explanation is consistent with Peacock et al.'s (2013) study as participants' mean BrAC was lower than 0.05% at 30 minutes when subjective stimulation/sedation was measure. However, this explanation could not impose to Marczinski et al.'s (2012a) study as participants in the AmED condition still perceived greater stimulation (with smaller magnitude as compare to Peacock et al.'s (2013) study) even when participants mean BrAC was at 0.07% when subjective measure was taken at 50 minutes post-consumption of drink. This explanation still does not apply to the current study as participants also given a 250mL standard ED and participants BrAC was lower than 0.05% during the first dosing interval or even when subsequent beverages were given. Nonetheless, it may still be due to the beverage administration between current study and previous literature that causes the null findings in enhanced stimulation effects in the AmED condition. Further exploration of this effect is required by administering two different dosing methods (e.g.: comparing the difference between multi-dosing and bolus administration of beverage)

As the current result suggest that participants perceived lower intoxication and impairment in the AmED condition, it appears contradictory when the hypothesised difference in stimulation/sedation is not evident. A possible explanation for this is that they are not a valid construct that measures the nature of intoxication. It is expected that subjective intoxication should be moderately correlated with stimulation and sedation, as they are cues that inform drinkers of their level of intoxication (Martin et al., 1993). The bivariate correlations revealed that the subjective stimulation and sedation were moderately correlated with subjective intoxication but had trivial relationship with objective measures (BrAC). The partial correlation revealed that after controlling for the subjective intoxication, revealed near zero-relationship between stimulation/sedation and BrAC; after controlling for the BrAC, the subjective intoxication still remained moderately correlated with stimulation and sedation. As such, regardless of Marczinski et al. (2012a) theory, stimulation and sedation cues are not particularly valid constructs for the nature of intoxication as they are unrelated to BrAC (eg: based on the nature of alcohol, it is the change of BrAC that produces stimulation/sedation).

Current findings also revealed that females reported greater stimulation in the AmED condition as compared to male even after controlling for BrAC differences. However, such difference were not demonstrated in the alcohol condition. This phenomenon is most likely also due to sex differences in body mass, composition and metabolism rate, where females have lower body mass and greater body fat to water ratio (Ireton-Jones, 2012). Such differences may increase the caffeine concentration in females' blood stream, and cause them to have greater caffeine reactivity towards the stimulation effects of caffeine and hence, had greater stimulation.

Implications

Current results suggest that co-ingestion of alcohol with ED reduces consumers' BrAC. When BrAC are reduced, less salient physiological and behavioural cues will be produced, and hence again lower their intoxication perception (Quinn & Fromme, 2012). This may then motivate them to drink more until they reach their desire intoxication effect.

Furthermore, after controlling for BrAC, current findings suggested that AmED causes consumers to feel less drunk, impaired and mentally fatigued. The result also showed that AmED does not enhance stimulation or diminish sedation, suggesting that higher EDs doses alter AmED consumers' perceived intensity of intoxication instead of altering the nature of intoxication. This finding raises an important implication: instead of stimulation and sedation cues, perceived impairment and fatigue may be stronger cues for drinkers, and better informing their subjective intoxication level. Acute alcohol intoxication (with BrAC > 0.05%) increases psychomotor and cognitive impairments, which can be assess by a range of objective measures (e.g.: reaction time and accuracy). Regardless of their actual impairments in cognitive and psychomotor abilities, drinkers (especially heavy drinkers) have higher confidence in their performance and also have lower perception of impairments (Brumback, Cao, & King, 2007; Tiplady, Franklin, & Scholey, 2004). This may suggest that drinkers use impairment level as a cue that guide their intoxication level.

As the current study found that participants perceive higher capability to drive during AmED condition, this may imply that there are two mechanisms: lower BrAC, feeling of intoxication that primes AmED consumers to engage in risky drinking practices or risky behaviours. These two mechanisms may be a maladaptive

function, as greater underestimation of intoxication and impairment level may lead AmED consumers to believe that their overall level of functioning is still intact. Hence, this may increase their tendency to overestimate their ability to engage in risky behaviours without harm, and engage in heavier drinking and potentially hazardous behaviours (Marczinski & Fillmore, 2009).

The current findings, coupled with existing research, suggest that sugar is the main ingredient that lower AmED consumers' BrAC. From this, it could be hypothesised that alcohol mixed with other sugary beverages (eg: soda) may also lower drinkers' BrAC relative to alcohol with artificially-sweetened mixers (Marczinski & Stamates, 2013). This field requires extensive research as sweet alcoholic drinks are heavily marketed. The sweetness also tends to cover the taste of alcohol, and could be a major motivation for consumers to drink such beverages (Anderson, Suhrcke, & Brookes, 2012; O'Brien et al., 2008). Furthermore, with the concern of obesity, the trend of artificial-sweetened mixers (eg: mixing diet coke with vodka) are also becoming increasingly popular (Rossheim & Thombs, 2011). Therefore, mixing alcohol with sugary beverages warrants further research as this may have important safety drinking implication for drinkers who prefer sweetened mixer.

Limitation and Future Research

The current study assuming that sugar is the key driver that affects the gastric emptying alcohol rate and lower the BrAC. However, no direct causal attributions of physiological mechanisms can be made yet as there was no direct measure of gastric emptying rate. As this study administered ED as a whole beverage, this study also could not attribute whether it is the sugar alone or the other ingredients or the drink as a whole that lowered the BrAC (Lubman et al., 2013). Future studies should

independently measure each main ingredient and the interaction of the ingredients to examine whether it is the main ingredients or ED as a whole that is lowering the BrAC. Furthermore, future studies should also objectively measure the gastric emptying rate (eg: using ultrasound) to infer a causal relationship between sugar or ED and gastric emptying.

Even though the current study supported hypothesis AmED causes the 'wide-awake drunkenness' and 'masking' of the impairment and fatigue cues, the direction is still unknown (whether perceived of lower impairment causes perceived of lower intoxication intensity or vice versa or both occurring simultaneously). Furthermore, this study also could not causally infer that lower perception of intoxication and impairment causes AmED consumers to be at increased risk of engaging in risky behaviour, even though they did perceive that they were more capable at driving, despite controlling for the BrAC. However, perceived capability to drive does not necessarily infer an 'intention' to drive or translate into actual engagement in drink drive (Peacock et al., 2012b). Peacock et al. (2012b) found that AmED consumers has lower odds retrospectively self-reporting risky behaviour after drinking AmED vs alcohol. They explain that this phenomenon may be due to the enhance arousal and alertness effect in AmED consumers, which then increasing their attentional resources for information processing and capacity to decide or avoid risky situations. A within-subject study conducted by Bromfield (in press) support this notion, where during the AmED condition, participants had faster reaction time without compromising their accuracy while completing a task that measure inhibition of frustration. However, these are only preliminary findings, hence more evidence is still required to understand the impact of AmED on risk taking by using objective risk-taking measure.

Even though this study had substantially improved ecological validity by administering beverages and dosage the mimics natural drinking patterns, this study was still a laboratory-based experiment, which had a different environment and atmosphere as compared to a bar. Fromme and Dunn (1992) suggested that environment and social (including social or peer norms) factors are also major determinants in influencing an individual subjective perception of intoxication. Therefore, the generalisability of results in such controlled environment may still be limited. Further observational studies in natural settings or set-up experiments in a more naturalistic environment (e.g., a laboratory-bar) should be conducted to examine whether these factors alter the perception of subjective intoxication in AmED consumers.

Conclusions

The findings of the current study suggest that AmED administration lowers participants' objective intoxication (BrAC) across the intoxication curve, particularly for females. Based on exiting research, it is concluded that sugar may be the main ingredient responsible for such reduction. After controlling for BrAC differences, AmED consumption produced moderate magnitude reduction in intoxication, impairment, and mental fatigue, and intensity and increased the perceived capability to drive across the intoxication curve. However, this study found no stimulation and sedation differences between treatment conditions across the intoxication curve. Preliminary results revealed that stimulation and sedation were a poor predictor of intoxication. Hence, this study suggests that with co-ingestion of alcohol and EDs that reflects the real-world dosage may alter the intensity of intoxication rather than the nature of intoxication. These results reflect the possible negative impact of AmED consumption, where it may impair consumers' ability to estimate their

intoxication and impairment level, which lead to increased likelihood of engaging in risky behaviours.

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Appendices

Appendix A: Statistical Analysis

Table 21

The Means, Standard Deviations in Parentheses, P-values and Effect Sizes of BrAC across time in Alcohol/ED Placebo and AmED Treatment Condition for Male Participants

Time	Alcohol/ED Placebo		AmED		Mean Difference	Sig Value	Effect Size (*g*)
	M	SD	M	SD			
0	-.002	.018	.002	.017	.003	p =.305	0.199
10	.018	.021	.014	.017	.004	p = .312	0.224
20	.022	.016	0.014	.016	.007	**p = .008****	**0.472**
30	.021	.014	.015	.014	.005	p = .015*	0.368
50	.034	.016	.022	.015	.012	p < .001***	**0.790**
60	.028	.014	.022	.015	.006	**p = .003****	**.0439**
70	.026	.015	.020	.014	.007	**p = .003****	**0.451**
90	.035	.017	.030	.016	.005	p = .117	0.282
100	.033	.016	.027	.014	.006	**p = .010***	**0.416**
110	.031	.016	.024	.014	.007	p = .002**	**0.501**
130	.043	.018	.038	.016	.005	p = .113	0.304
140	.038	.018	.035	.014	.003	p = 002**	0.213
150	.036	.017	.030	.013	.006	p = .026**	0.365
170	.033	.018	.027	.015	.006	p = .049*	0.369
180	.031	.015	.025	.015	.007	**p = .008****	**0.436**
190	.029	.015	.023	.014	.006	**p = .008****	**0.413**
200	.024	.016	.022	.013	.003	p = .255	0.183
210	.025	.015	.020	.014	.005	p = .018*	0.367
220	.022	.01	.018	.016	.004	p =.154	0.250

Note. *p < .050, ** p <.010, *** p <.001.

Table 22

The Means, Standard Deviations in Parentheses, P-values and Effect Sizes of BrAC across time in Alcohol/ED Placebo and AmED Treatment Condition for Female Participants

Time	Alcohol/ED Placebo		AmED		Mean Difference	Sig Value	Effect Size (*g*)
	M	SD	M	SD			
0	.003	.018	.002	.017	.001	p = .876	0.029
10	.028	.012	.025	.017	.003	p = .433	0.157
20	.029	.016	.026	.016	.002	p = .433	0.133
30	.031	.015	.027	.015	.004	p = .096	0.245
50	.045	.017	.040	.015	.005	p = .066	0.310
60	.015	.009	.038	.015	.009	p < .001***	**0.624**
70	.043	.015	.039	.014	.004	p = .085	0.251
90	.057	.018	.052	.016	.006	p = .078	0.322
100	.057	.017	.050	.014	.007	p = .005**	**0.463**
110	.058	.016	.051	.014	.007	p = .003**	**0.482**
130	.072	.019	.059	.016	.013	p < .001***	**0.716**
140	.069	.019	.062	.014	.006	p = 038*	0.377
150	.066	.017	.058	.014	.008	p = .003**	**0.510**
170	.063	.019	.054	.015	.009	p = .005**	**0.530**
180	.058	.01	.048	.015	.015	p <. 001***	**0.639**
190	.061	.015	.045	0.15	.016	p < .011***	**1.039**
200	.055	.017	.044	.014	.011	p < .001***	**0.688**
210	.057	.016	.040	.014	.017	p < .001***	**1.119**
220	.052	.016	.038	.010	.017	p < .001***	**0.842**

Note. *p < .050, ** p <.010, *** p <.001.

Table 23

The Mean, Standard Deviation, and The Pairwise Comparison for All Subjective Variables Condition× Time Interactions with p-Values and Effect Size (Hedge's g)

Variable	Time	Alcohol		AmED		Sig. Value (*p-Value)*	Effect Size (*g)*
		M	SD	M	SD		
SES							
Feel Intoxicated	0	9.47	26.47	12.80	24.88	.452	0.128
	10	19.11	22.96	16.18	22.00	.432	0.128
	20	24.39	25.54	17.62	22.06	.123	0.280
	30	22.33	22.82	15.56	21.94	.455	0.122
	50	27.57	22.65	20.67	20.63	.055	0.314
	60	33.64	26.62	23.27	19.74	**.020***	**0.436**
	70	26.87	22.84	20.43	19.82	.063	0.297
	90	37.51	24.61	22.38	18.73	< **.001*****	**0.682**
	100	35.42	23.39	22.91	18.84	**.001****	**0.580**
	110	31.92	24.46	24.10	19.65	.042	0.347
	130	40.27	29.94	25.50	20.05	< **.001*****	**0.660**
	140	36.70	24.51	28.37	22.83	.051	0.347
	150	37.65	23.46	27.89	22.15	**.015***	**0.422**
	170	31.68	22.39	26.01	21.44	.117	0.255
	180	34.00	24.99	29.69	23.11	.342	0.176
	190	30.62	25.05	25.63	20.54	.223	0.215
	200	27.11	24.13	20.31	19.78	.072	0.304
	210	23.69	24.58	20.49	19.07	.388	0.143
	220	19.56	23.65	19.16	19.47	.911	0.018

Variable	Time	Alcohol		AmED		Sig. Value (*p-Value)*	Effect Size (*g)*
		M	*SD*	*M*	*SD*		
Feel Impaired							
	0	5.51	22.94	10.62	18.43	.141	0.242
	10	12.77	22.24	10.01	18.68	.477	0.132
	20	19.39	23.61	10.88	17.63	**.038***	**0.402**
	30	18.02	18.80	11.38	16.39	.014*	0.371
	50	21.96	20.28	13.87	16.30	**.012***	**0.434**
	60	28.23	20.31	19.73	17.00	**.011***	**0.447**
	70	24.38	19.70	15.65	15.52	**.003****	**0.485**
	90	29.25	23.10	16.92	16.75	**.002****	**0.602**
	100	29.74	22.28	19.88	16.43	**.009****	**0.496**
	110	25.60	20.80	17.59	16.96	**.020***	**0.416**
	130	30.89	21.01	20.46	18.24	**.004****	**0.522**
	140	26.07	19.93	25.13	21.23	.807	0.045
	150	32.22	21.94	21.62	17.17	**.005****	**0.530**
	170	17.93	10.91	16.94	10.31	.038*	0.308
	180	25.69	18.96	26.18	19.43	.886	0.025
	190	25.48	21.81	20.40	16.10	.145	0.261
	200	19.48	19.33	18.06	17.01	.635	0.077
	210	18.72	19.55	14.83	16.58	.194	0.211
	220	14.59	17.21	13.16	15.55	.489	0.086

Variable	Time	Alcohol		AmED		Sig. Value (*p-Value)*	Effect Size (*g)*
		M	*SD*	*M*	*SD*		
Feel Mentally Fatigued							
	0	9.61	19.43	10.59	18.59	.807	0.051
	10	5.61	14.03	5.42	13.01	.946	0.014
	20	10.63	17.96	11.46	14.82	.829	0.050
	30	8.85	13.41	7.44	12.42	.596	0.107
	50	13.21	13.84	6.34	10.95	**.013****	**0.543**
	5	17.19	15.42	10.07	10.66	**.019****	**0.529**
	60	17.02	17.09	11.28	11.72	.089	0.392
	70	20.00	17.56	10.10	10.88	**.005****	**0.668**
	90	24.13	18.04	11.90	10.97	**.001****	**0.807**
	100	23.27	17.48	10.03	9.66	**< .001*****	**0.924**
	110	26.98	19.27	13.98	11.44	**.001****	**0.809**
	130	22.81	17.16	15.11	12.04	**.023***	**0.512**
	140	25.11	16.9	12.95	11.49	**< .001*****	**0.829**
	150	32.22	19.17	18.32	17.72	**.003****	**0.742**
	170	33.06	21.59	23.27	16.33	**.046***	**0.504**
	180	29.76	21.27	18.27	15.78	**.017***	**0.605**
	190	23.58	18.18	16.64	14.70	.088	0.414^{+}
	200	20.81	18.10	15.99	15.89	.249	0.079
	210	19.03	14.23	16.73	18.79	.568	0.136
Feel legally able to drive							
	0	90.06	42.87	82.83	45.78	.391	0.161
	10	59.61	42.40	70.24	40.71	.192	0.252
	20	56.06	40.78	69.54	37.85	.066	0.338

Variable	Time	Alcohol		AmED		Sig. Value (*p-Value)*	Effect Size (*g)*
		M	SD	M	SD		
	30	58.04	39.06	70.32	36.74	.068	0.319
	50	45.80	37.91	61.10	34.09	**.013***	**0.418**
	60	41.22	38.99	58.50	32.98	**.006****	**0.471**
	70	41.98	37.8	58.60	30.71	**.003****	**0.476**
	90	36.42	40.66	55.50	30.53	**.003****	**0.523**
	100	34.61	39.50	53.83	30.18	**.002****	**0.539**
	110	35.13	37.76	55.40	30.31	**< .001*****	**0.583**
	130	34.05	37.01	50.43	34.89	**.005****	**0.449**
	140	32.16	37.32	50.18	32.21	**.001****	**0.509**
	150	35.26	37.65	51.84	31.94	**.003****	**0.468**
	170	43.63	35.70	57.63	29.95	**.003****	**0.419**
	180	45.13	35.89	54.69	30.27	.041*	0.284
	190	47.29	37.35	58.19	31.72	.045*	0.310
	200	51.93	38.07	57.49	30.20	.282	0.160
	210	58.55	30.08	55.94	36.98	.588	0.076
	220	58.83	37.09	59.28	30.43	.928	0.013
Feel Stimulated							
	0	29.29	36.91	28.19	39.32	.890	0.028
	10	35.77	27.32	39.70	29.74	.429	0.136
	20	40.14	26.37	40.28	29.54	.976	0.005
	30	36.36	24.81	44.25	30.57	.097	0.279
	50	36.62	24.76	43.77	29.68	.123	0.258
	60	39.36	24.02	40.48	27.33	.768	0.043

Variable	Time	Alcohol		AmED		Sig. Value (*p-Value)*	Effect Size (*g)*
		M	SD	M	SD		
	70	34.96	24.14	45.14	33.39	.063	0.344
	90	39.78	24.80	42.23	26.88	.517	0.094
	100	41.81	25.03	46.26	26.31	.233	0.171
	110	40.11	24.64	39.03	25.06	.742	0.043
	130	45.03	27.11	44.89	25.06	.971	0.005
	140	40.44	27.40	40.18	24.60	.944	0.010
	150	38.82	25.92	38.58	26.14	.950	0.009
	170	36.18	25.90	36.66	23.96	.885	0.019
	180	34.13	26.92	37.58	27.33	.439	0.125
	190	33.46	26.41	38.78	27.21	.223	0.195
	200	30.53	26.59	35.49	27.70	.270	0.180
	210	25.27	30.19	38.42	27.18	**.014***	**0.451**
	220	26.00	27.79	35.07	28.84	.074	0.316
Feel Sedated							
	0	10.22	23.17	11.08	19.73	.850	0.039
	10	13.31	20.11	7.48	15.24	.134	0.322
	20	15.04	17.23	10.62	13.75	.147	0.279
	30	8.22	14.27	12.05	14.65	.136	0.261
	50	12.54	13.19	11.56	13.23	.651	0.073
	60	14.55	13.60	10.81	13.74	.117	0.270
	70	13.10	14.25	12.85	12.08	.905	0.019
	90	15.47	19.02	13.13	12.47	.477	0.143
	100	17.27	15.00	12.92	15.14	.138	0.285
	110	19.65	15.67	12.99	14.75	.030*	**0.432**

Variable	Time	Alcohol		AmED		Sig. Value (*p-Value)*	Effect Size (*g)*
		M	SD	M	SD		
	130	17.34	14.42	16.04	21.06	.734	0.071
	140	16.17	15.51	12.41	17.37	.256	0.225
	150	22.05	18.43	16.38	15.72	.119	0327
	170	20.01	17.82	16.37	17.17	.338	0.205
	180	18.80	16.81	20.66	18.82	.636	0.102
	190	24.17	19.43	16.86	15.60	.064	0.409^{+}
	200	20.69	17.81	12.16	12.27	**.009****	**0.550**
	210	21.66	22.60	15.58	16.42	.188	0.303
	220	20.93	21.99	12.76	17.05	.077	0.409^{+}
BAES							
Stimulation							
	0	16.11	18.89	19.10	20.80	.303	0.149
	2	24.2	15.69	27.12	16.83	.212	0.159
	5	23.37	16.27	27.89	15.8	.037*	0.278
	8	24.47	16.53	28.24	16.15	.077	0.228
	11	25.44	16.94	26.75	16.14	.479	0.078
	14	19.14	16.47	22.69	16.14	.106	0.215
	17	17.55	16.40	20.12	17.24	.314	0.151
Sedation							
	0	6.50	11.46	7.58	10.45	.529	0.097
	2	7.63	7.49	7.50	6.57	.905	0.018
	5	10.43	9.62	8.71	6.93	.332	0.202
	8	13.57	10.78	9.34	7.27	**.034***	**0.454**
	11	16.25	15.3	11.69	8.57	.115	0.362
	14	15.47	13.89	14.35	10.57	.709	0.089
	17	12.07	10.24	10.10	11.92	.463	0.174

Note. * $p < .050$, ** $p < .010$, *** $p < .001$. **BOLD =** $p < .05$, $g > 0.400$. $^{+}$ = Comparisons did not reach significant level ($p > .05$, $g > 0.400$, indicating moderate effects. SES = Subjective Effects Scale, BAES = Biphasic Effects Scale.

Table 24

The F-statistics for All Subjective Ratings Variables Without Controlling for the BrAC

Variable	Condition	Time	Sex	Session	Condition× Time	Condition × Sex	Sex × Time	Condition × Time ×Sex
SES								
Intoxicated	***F*(1,689) = 95.33,**	***F*(18,75) = 23.45**	*F*(1,27) = 1.33,	***F*(1,695) = 0.13,**	*F*(18,75) = 1.66,	***F*(1,697) = 8.25,**	***F*(18,71) = 7.50,**	*F*(18,74) = 0.50,
	***p* = < .001**	***p* <. 001**	*p* = .259	***p* = .722**	*p* = .067	***p* = .004**	***p* < .001**	*p* = .952
Impaired	***F*(1,626) = 74.00,**	***F*(18,75) = 19.24,**	*F*(1,28) = 0.52,	*F*(1,601) = 0.11,	***F*(18,75) = 1.90**	*F*(1,629) = 2.52,	***F*(18,72) = 5.52,**	*F*(18,73) = 0.78
	***p* < .001**	***p* < .001**	*p* = .477	*p* = .749	***p* = .028**	*p* = .113	***p* < .001**	*p* = .719
Mentally Fatigued	***F*(1,580) = 72.56,**	***F*(18,68) = 10.50,**	*F*(1,27) = 0.18	***F*(1,580) = 8.27,**	***F*(18,68) = 2.00,**	***F*(1,560) = 6.12,**	*F*(18,69) = .72,	*F*(18,68) = .69,
	***p* < .001**	***p* < .001**	*p* = .677	***p* = .004**	***p* = .022**	***p* = .014**	*p* = .778	*p* = .807

Variable	Condition	Time	Sex	Session	Condition× Time	Condition × Sex	Sex × Time	Condition × Time ×Sex
Legally Able to Drive	***F*(1,619) = 79.63,** ***p* < .001**	***F*(18,47) = 14.76** ***p* < .001**	*F*(1,28) = 3.95, *p* = .057	***F*(1,646) = 11.07,** ***p* = .001**	*F*(18,46) = 1.56, *p* = .113	*F*(1,644) = 1.07, *p* = .301	***F*(18,47) = 3.80,** ***p* < .001**	*F*(18,46) = 0.30 *p* = .996
Stimulated	***F*(1,610) = 13.30** ***p* < .001**	***F*(18,68) = 3.19,** ***p* < .001**	*F*(1,28) = 3.08, *p* = .090	***F*(1,629) = 65.93** ***p* < .001**	*F*(18,68) = 0.87 *p* = .620	***F*(1,597) = 7.45,** ***p* = .006**	***F*(18,68) = 1.99,** ***p* = .023**	*F*(18,66) = 0.64, *p* = .854
Sedated	***F*(1,619) = 15.58,** ***p* < .001**	***F*(18,74) = 4.19** ***p* < .001**	*F*(1,27) = 1.08, *p* = .307	*F*(1,493) = 1.51, *p* = .220	*F*(18,75) = 1.29, *p* = .220	*F*(1,611) = 3.14, *p* = .077	*F*(18,73) = 1.82 *p* = .039	*F*(18,74) = 0.88, *p* = .601
BAES								
Stimulated	***F*(1,269) = 14.05,** ***p* < .001**	***F*(6,55) = 9.27,** ***p* < .001**	*F*(1,27) = 3.40, *p* = .076	***F*(1,281) = 6.79,** ***p* = .010**	*F*(6,55) = 0.31, *p* = .929	*F*(1,265) = 1.02, *p* = .313	***F*(6,53) = 3.15,** ***p* = .010**	*F*(6,55) = .74, *p* = .621

Variable	Condition	Time	Sex	Session	Condition× Time	Condition × Sex	Sex × Time	Condition × Time ×Sex
Sedated	***F*(1,189) = 5.52,** ***p* = .020**	***F*(6,67) = 11.51** ***p* < .001**	*F*(1,29) = 0.09, *p* = .762	***F*(1,150) = 14.12,** ***p* < .001**	*F*(6,67) = 1.23 *p* = .302	*F*(1,179) = 1.26, *p* = .263	*F*(6,64) = 1.47, *p* = .203	*F*(6,66) = 1.23, *p* = .304

Note. SES = Subjective Effects Scale, BAES = Biphasic Effects Scale.

Appendix B: Testing Materials

Appendix B1: Time Line Follow Back (TLFB)

Appendix B2: Subjective Effects Scale (SES)

Appendix B3: Biphasic Alcohol Effects Scale (BAES)

Appendix B4: Beverage Rating Scale (BRS)

Appendix B1

Timeline Follow Back (TLFB)

ID_____ Date_____

Timeline Follow-back Calendar 2016

Please indicate by circling dates on which days you have consumed alcohol in the preceding month (last 30 days).

1 Standard Drink is Equal to

One 375ml mid-strength bottle/can beer

One 100ml standard serve red/white wine

One 30ml spirit nip (e.g. rum, vodka, whiskey)

One 250m pre-mixed spirit (5% alc)

Complete the Following

Start Date (Day 1): _____ **End Date** (yesterday):_____

2016 JANUARY

SUN	MON	TUE	WED	THU	FRI	SAT
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31						

2016 FEBRUARY

SUN	MON	TUE	WED	THU	FRI	SAT
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29					

2016 MARCH

SUN	MON	TUE	WED	THU	FRI	SAT
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

2016 APRIL

SUN	MON	TUE	WED	THU	FRI	SAT
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30

2016 MAY

SUN	MON	TUE	WED	THU	FRI	SAT
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

2016 JUNE

SUN	MON	TUE	WED	THU	FRI	SAT
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30		

2016 JULY

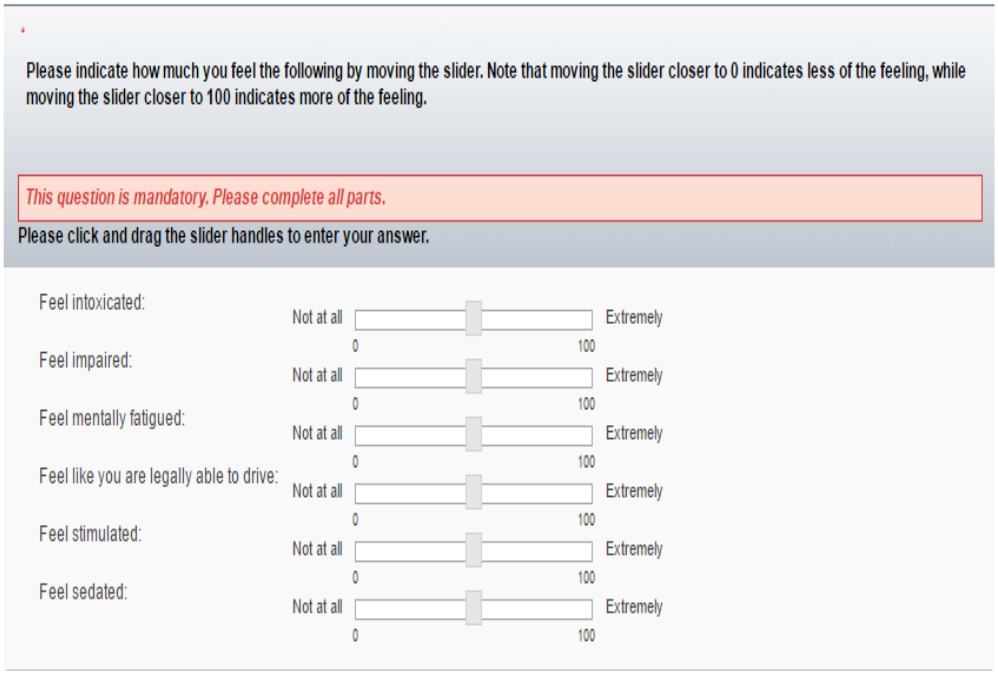
SUN	MON	TUE	WED	THU	FRI	SAT
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31						

2016 AUGUST

SUN	MON	TUE	WED	THU	FRI	SAT
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			

Appendix B2:

Subjective Effects Scale (SES)



Please indicate how much you feel the following by moving the slider. Note that moving the slider closer to 0 indicates less of the feeling, while moving the slider closer to 100 indicates more of the feeling.

This question is mandatory. Please complete all parts.

Please click and drag the slider handles to enter your answer.

Feel intoxicated:	Not at all	0 100	Extremely
Feel impaired:	Not at all	0 100	Extremely
Feel mentally fatigued:	Not at all	0 100	Extremely
Feel like you are legally able to drive:	Not at all	0 100	Extremely
Feel stimulated:	Not at all	0 100	Extremely
Feel sedated:	Not at all	0 100	Extremely

Appendix B3:

The Biphasic Alcohol Effects Scale

* The following adjectives describe feelings that some people have after drinking alcohol. Please indicate the extent to which each of these adjectives describes your feelings at the present time. Please respond as honestly and accurately as possible, even if some items appear similar to previous items completed.

	Not at all 0	1	2	3	4	5	6	7	8	9	Extremely 10
Difficulty concentrating	○	○	○	○	○	○	○	○	○	○	○
Down	○	○	○	○	○	○	○	○	○	○	○
Elated	○	○	○	○	○	○	○	○	○	○	○
Energised	○	○	○	○	○	○	○	○	○	○	○
Excited	○	○	○	○	○	○	○	○	○	○	○
Heavy head	○	○	○	○	○	○	○	○	○	○	○
Inactive	○	○	○	○	○	○	○	○	○	○	○
Sedated	○	○	○	○	○	○	○	○	○	○	○
Slow thoughts	○	○	○	○	○	○	○	○	○	○	○
Sluggish	○	○	○	○	○	○	○	○	○	○	○
Stimulated	○	○	○	○	○	○	○	○	○	○	○
Talkative	○	○	○	○	○	○	○	○	○	○	○
Up	○	○	○	○	○	○	○	○	○	○	○
Vigorous	○	○	○	○	○	○	○	○	○	○	○

Appendix B4:

Beverage Rating Scale (BRS)

Please estimate the number of standard alcoholic drinks you have been drinking just now.

*Please choose only one of the following:

- ○ 0 standard drinks
- ○ 0.5 standard drinks
- ○ 1.0 standard drinks
- ○ 1.5 standard drinks
- ○ 2.0 standard drinks
- ○ 2.5 standard drinks
- ○ 3.0 standard drinks
- ○ 3.5 standard drinks
- ○ 4.0 standard drinks
- ○ 4.5 standard drinks
- ○ 5.0 standard drinks
- ○ 5.5 standard drinks
- ○ 6.0 standard drinks
- ○ 6.5 standard drinks
- ○ 7.0 standard drinks
- ○ 7.5 standard drinks
- ○ 8.0 standard drinks
- ○ 8.5 standard drinks
- ○ 9.0 standard drinks

Please estimate the number of energy drinks (1 serve = 250mL) you think you have consumed just now.

*Please choose only one of the following:

- ○ 0 energy drinks
- ○ 0.5 energy drinks
- ○ 1.0 energy drinks
- ○ 1.5 energy drinks
- ○ 2.0 energy drinks
- ○ 2.5 energy drinks
- ○ 3.0 energy drinks

Please estimate the number of standard alcoholic drinks you have consumed since arriving for the session.

*Please choose only one of the following:

- ○ 0 standard drinks
- ○ 0.5 standard drinks
- ○ 1.0 standard drinks
- ○ 1.5 standard drinks
- ○ 2.0 standard drinks
- ○ 2.5 standard drinks
- ○ 3.0 standard drinks
- ○ 3.5 standard drinks
- ○ 4.0 standard drinks
- ○ 4.5 standard drinks
- ○ 5.0 standard drinks
- ○ 5.5 standard drinks
- ○ 6.0 standard drinks
- ○ 6.5 standard drinks
- ○ 7.0 standard drinks
- ○ 7.5 standard drinks
- ○ 8.0 standard drinks
- ○ 8.5 standard drinks
- ○ 9.0 standard drinks

Please estimate the number of energy drinks (1 serve = 250mL) you think you have consumed since arriving for the session.

*Please choose only one of the following:

- ○ 0 energy drinks
- ○ 0.5 energy drinks
- ○ 1.0 energy drinks
- ○ 1.5 energy drinks
- ○ 2.0 energy drinks
- ○ 2.5 energy drinks
- ○ 3.0 energy drinks

Appendix C. Ethics Requirements

Appendix C1: Ethics Amendment Letter

Appendix C2: Information Sheet and Consent Form

Appendix C3: Declaration of Abstinence and Compliance

Appendix C4: Online Screening Questionnaire

Appendix C1:

Ethics Amendment Approval Letter

From: Lauren.Black@utas.edu.au <Lauren.Black@utas.edu.au>
Sent: Monday, 2 May 2016 4:18 PM
To: Raimondo Bruno
Cc: Amy Peacock; Jess Forward; Lauren Black
Subject: Notification of Amendment Approval: H0014110 Alcohol and Energy Drink Component Interactions

Dear AssocProf Bruno

Ethics Ref: H0014110
Title: Alcohol and Energy Drink Component Interactions

This email is to confirm that the following amendment was approved by the Chair of the Tasmania Health and Medical Human Research Ethics Committee on 2/5/2016:

Amendment Protocol study 2 version April 2016
Amendment Protocol study 1 version April 2016

All committees operating under the Human Research Ethics Committee (Tasmania) Network are registered and required to comply with the National Statement on Ethical Conduct in Human Research (NHMRC 2007).

This email constitutes official approval. If your circumstances require a formal letter of amendment approval, please let us know.

Should you have any queries please do not hesitate to contact me.

Kind regards

Lauren Black
--
Lauren Black
Executive Officer - Ethics
Office of Research Services
University of Tasmania
Private Bag 01
Hobart TAS 7001
Phone: (03) 6226 2764
Fax: (03) 6226 2765
Email: Lauren.Black@utas.edu.au
Web: http://www.research.utas.edu.au/

Appendix C2:

Information Sheet and Consent Form

Information Sheet

Alcohol and Energy Drink Component Interactions: Study 1 and Alcohol and Energy Drink Component Interactions: Study 2
March, 2016

Introduction

You are invited to participate in an experiment examining the effect of independent and combined consumption of energy drinks and alcohol on performance. The purpose of this study is to investigate whether energy drinks alter the impact of alcohol on risk-taking through measurement of behavioural outcomes. The research is being conducted by Holly Bromfield and Xiao Min Leong in partial fulfilment of the requirements of an Honours degree. Holly and Xiao are being supervised by Dr Raimondo Bruno and Dr Amy Peacock from the School of Psychology, University of Tasmania. The researchers can be contacted as following: Holly Bromfield; hollyb1@utas.edu.au: + 61 3 6226 2924; Xiao Min Leong; xmleong@utas.edu.au; + 61 3 6226 2924).

What is the purpose of the study?
The purpose of this study is to investigate whether energy drinks or caffeinated/sugary drinks alter the impact of alcohol on performance through measurement of behavioural (e.g., reaction time, accuracy, decision-making) outcomes; and to compare subjective and objective measures of intoxication.

Who can participate?
We are currently seeking participants who are:

- Male/Female
- Aged 18-35 years
- English as a first language
- Completed Year 12
- Normal or corrected-to-normal vision
- Normal sleep patterns
- Healthy (no history of significant neurological disorder or current psychiatric disorder, significant intellectual disorder, alcohol/drug dependence, regular tobacco use, or chronic health problems)
- Regular energy drink consumers (minimum consumption of 1 energy drink in the preceding month and maximum consumption of 1 energy drink per day in the last month)
- Regular caffeine consumers (minimum consumption of 5 caffeinated beverages in the last week)
- Regular alcohol consumers (minimum consumption of 5 standard alcoholic drinks on one occasion in the preceding month)
- Not currently using illicit drugs (i.e., use in the preceding six months)

- Able to attend the Hobart campus of the University of Tasmania for one 60-minute session commencing at a time between 9am and 5pm, and two240 minute sessions commencing at 9am or 1pm.

What does participation in the study involve?
This research will be conducted in the Perception Laboratory at the School of Psychology, University of Tasmania (Hobart). Interested individuals will complete a brief screening questionnaire online that collects data about demographics (e.g., age, sex), medical history, and use of caffeine, alcohol, energy drinks and other drugs. Eligible participants will be asked to attend the Perception Laboratory for three sessions: one familiarisation session conducted between 9am and 5pm and two experimental sessions commencing at either 9am or 1pm and separated by a minimum of 4 and maximum of 14 days.

Familiarisation session (session 1: 60-minutes duration)
To confirm eligibility prior to participation, volunteers will be asked to complete several paper screening questionnaires in person, including measures of general intellectual and psychological functioning.
If participants are deemed eligible following completion of these measures, they will be asked to complete a number of other measures assessing personality, and alcohol, caffeine, and energy drink use, and their height and weight will be measured. Participants will then practice the tasks which will be completed in the experimental sessions.

Experimental sessions (session 2 x 240 minutes duration/session)
At the beginning of each experimental session participants will consume a different beverage containing energy drink and/or alcohol and/or sugar and/or caffeine. Alcohol and energy drink content will be equivalent to a maximum of 6 standard alcoholic drinks, 3 250mL energy drinks, respectively per session. The caffeine beverage will contain the equivalent caffeine as the energy drink, the sugar beverage will contain equivalent sugar of the energy drink. Participants will not be informed of the beverage content administered in each session until the conclusion of all sessions.

After consuming the beverage, participants will be asked to complete a range of computerised behavioural laboratory tasks while their responses are recorded. A breathalyser will be used to monitor participants' breath alcohol concentration throughout the duration of the study. Throughout testing, participants will be asked to complete several scales assessing their mood and feeling of intoxication and impairment as well as computerised tasks. Participants will be debriefed regarding the order of dose administration at the conclusion of all sessions.

What are the restrictions regarding participating?
Participants will be asked to fast from food for 4 hours prior to each experimental session and abstain from caffeine for 8 hours and alcohol and prescription medication for 24 hours prior to each session. Participants will be asked to abstain from illicit drugs and tobacco for the duration of participation. Participants will be asked to consume a standard meal (provided in the familiarisation session) one hour prior to each session.

At the end of each session, participants will remain at leisure (with food and entertainment provided) until they attain two consecutive breathalyser recordings of 0.03% or less measured 15 minutes apart.

Participants holding their provisional driver licence, who are intending to drive will be required to remain in the laboratory until two consecutive BrAC measurements are recorded at .00%. Participants holding their provisional licence who are not intending to drive, will be able to leave the laboratory at .03% BrAC if they sign a declaration in which they agree to be escorted by a nominated guardian to their place of residence and accompanied for a two-hour period following session completion. The nominated guardian must be an adult aged 18 years or older who: (i) holds their provisional or full driver licence (ii) directly collects the participant from the research premises and meets the researcher in-person, and (iii) signs a declaration agreeing to escort the participant directly to their place of residence and accompany the participant for the two-hour period following session completion. The researcher reserves the right to retain participants in the laboratory until .03% BrAC for those holding their full driver licence and .00% BrAC for those holding their provisional licence when it is deemed unsafe for the participant to leave at .03% BrAC.

What are the benefits of participating?
Your participation will help us enhance our knowledge of the effects of popular energy drinks on people's perceived and actual level of alcohol-induced impairment. This knowledge can be used to help educate people regarding the potential outcomes of independent and combined alcohol and energy drink or caffeinated drink use.

What are the risks associated with participating?
There are no anticipated risks of this research. However, if in the unlikely event you experience negative side-effects, please inform the experimenter and the necessary assistance will be sought and provided. We ask that participants refrain from consuming alcohol or operating heavy machinery for four hours' post-session.

Is there any monetary reimbursement for participation?
Participants will be reimbursed $80 (i.e. $40 per experimental session) at the conclusion of the sessions as recompense for their time. Participants who do not complete the full schedule of sessions will not be reimbursed, unless withdrawal is necessary due to an unexpected adverse physiological reaction to the investigatory products. Partial reimbursement will be provided in this situation dependent on the number of sessions completed. KHA111/112 students may receive up to 8-hours research participation credit as reimbursement for time and expenses incurred, with a deduction of $10 monetary reimbursement for each hour of research participation credit awarded (e.g. total reimbursement of 6 hours credit plus $20, 5 hours credit plus $10, etc.).

How do I volunteer to participate? What if I want to withdraw from participating?
Participation in this study is voluntary. By signing the attached consent form, you are indicating that you are aware of the nature of the study and wish to participate. While we would be pleased to have you participate, we respect your right to decline. There will be no consequences to you if you decide not to participate. If you decide to discontinue participation at any time, you may do so without providing an

explanation. However, you will be required to remain in the laboratory until your breath alcohol concentration measurement equals 0.03% or less on two separate occasions measured 15 minutes apart.

What will happen to the information I provide?
All information collected will be kept confidential. Each participant will be assigned a treatment code and individual participant data will be identifiable only by that code. All of the data will be stored on password protected secure computers or in a locked cabinet in the School of Psychology for a minimum of five years after the publication of any academic journal articles, at which point all questionnaires will be destroyed using a paper shredder and electronic data will be deleted. The screening questionnaire will be securely destroyed immediately on completion of the study and that any information provided by the participant on the questionnaire will be identifiable only by participant number, kept confidential, and viewed only by the experimenter.

Who do I contact if I have any queries?
If you would like to discuss any aspect of this study, please contact Holly Bromfield (hollyb1@utas.edu.au; + 61 3 6226 2924) or Xiao Min Leong (xmleong@utas.edu.au; +61 3 6226 2924). Alternatively, you can contact Dr Raimondo Bruno on (03) 6226 2240 or email Raimondo.Bruno@utas.edu.au.

How do I find out the results of the study?
A summary of the results will be available on the Research webpage of the School of Psychology, University of Tasmania (http://fcms.its.utas.edu.au/scieng/psychol/). Results of the study can also be provided by Holly Bromfield (hollyb1@utas.edu.au; + 61 3 6226 2924) or Xiao Min Leong (xmleong@utas.edu.au; +61 3 6226 2924)

Who do I contact if I have a complaint about the study?
This study has been approved by the Tasmanian Social Science Human Research Ethics Committee. If you have concerns or complaints about the conduct of this study should contact the Executive Officer of the HREC (Tasmania) Network on (03) 6226 7479 or email human.ethics@utas.edu.au. The Executive Officer is the person nominated to receive complaints from research participants. You will need to quote.

Thank you for taking the time to consider this study.
If you wish to take part in it, please sign the attached consent form.
This information sheet is for you to keep.

School of Psychology
University of Tasmania

Consent Form

Alcohol and Energy Drink Component Interactions: Study 1 and Alcohol and Energy Drink Component Interactions: Study 2

1. I have read and understood the 'Information Sheet' for this project.
2. The nature and possible effects of the study have been explained to me.
3. I understand that the study involves attending the Cognitive Neuroscience Laboratory for one 60 minute familiarisation session and two 240 minute experimental sessions.
4. I understand that in the familiarisation session I will complete measures of psychological distress, premorbid intelligence, and alcohol use, as well as having my height and weight measured. If I am eligible to participate in the study, I will be asked to complete further measures of personality, behaviour and alcohol, caffeine, and energy drink use. I will also practice the tasks which form part of the experimental sessions.
5. I understand that I will be asked to abstain from food for 4 hours, caffeine-containing products for 8 hours, and alcohol and prescription medication for 24 hours prior to each session, and illicit drugs and tobacco for the duration of the study. I will be asked to consume a provided standard meal 60 minutes prior to each experimental session. I will be asked to sign a declaration and complete a breath alcohol concentration measurement (via a breathalyser) to confirm my abstinence at the start of each session.
6. I understand that in the two sessions I will receive a beverage containing energy drinks and/or alcohol and/or caffeine and/or sugar. I understand that I may be given a maximum of 6 standard alcoholic drinks and 3 250mL energy drinks per session, and that I will not be informed of the specific contents of the beverage for each session until the conclusion of testing. I understand that after beverage consumption, I will be asked to complete a number of computerised laboratory behavioural performance tasks during which my behavioural responses will be recorded. I understand that my breath alcohol concentration (as measured via a breathalyser) will be recorded throughout the session, and that I will be asked about my perception of my intoxication and level of impairment and will be required to complete computerised tasks.
7. I understand that I will be asked to remain in the laboratory until my blood alcohol concentration equals 0.03% or less on two occasions measured 15 minutes apart. I acknowledge that I have been advised to refrain from drinking alcohol or operating a vehicle or other heavy machinery for four hours after the end of the experimental session.
8. I understand that if I hold a provisional driver licence and I intend to drive I will be required to remain in the laboratory until my breath alcohol concentration is .00% on two consecutive occasions. I understand that if I hold a provisional driver licence and do not intend to drive I will be able to leave the laboratory at .030% BrAC after signing a declaration in which I agree to be escorted by my nominated legal adult to my place of residence and be accompanied for a two hour period following session completion. I understand that the nominated legal guardian must

be an adult aged 21 years or older who: (i) holds their provisional or full driver licence (ii) directly collects me from the research premises and meets the researcher in-person, and (iii) signs a declaration agreeing to escort me directly to my place of residence and accompany me for the two hour period following session completion. Furthermore, I understand that the researcher reserves the right to retain participants in the laboratory until .03% BrAC for those holding their full driver licence and .00% BrAC for those holding their provisional licence when it is deemed unsafe for the participant to leave at .03% BrAC. I acknowledge that I have been advised to refrain from drinking alcohol or operating a vehicle or other heavy machinery for four hours after the end of experimental sessions.

9. I understand that I will be reimbursed $80 (i.e., $40 per experimental session) for my participation on conclusion of the two experimental sessions. I understand that if I am a KHA111/112 student I can opt to be reimbursed up to six hours research participation credit in addition to at least $20 monetary reimbursement. If I withdraw from the study prior to concluding all sessions I will not be eligible for monetary reimbursement, unless the withdrawal is due to an unexpected adverse event occurring as a consequence of ingesting the beverage, whereby I will be provided partial reimbursement consummate with the number of sessions completed.
10. I understand that, while there are no anticipated risks associated with this study, I should inform the experimenter immediately if any unexpected negative side-effects are experienced. I understand the experimenter will immediately cease the session and seek the necessary assistance.
11. I understand that the researchers will maintain my confidentiality and that any information I supply to the researcher(s) will be used only for the purposes of the research. My data will only be identifiable by an individual numerical participant code.
12. I understand that the screening questionnaire will be securely destroyed immediately on completion of the study and that any information I provide on the questionnaire will be identifiable only by my participant number, kept confidential, and viewed only by the experimenter.
13. I understand that all research data will be securely stored on the University of Tasmania premises for at least five years, and will then be securely destroyed when no longer required.
14. I agree that research data gathered from me for the study may be published provided that I cannot be identified as a participant.
15. I agree to participate in this investigation and understand that I may withdraw at any time without any effect, and if I so wish, may request that any data I have supplied to date be withdrawn from the research.
16. Any questions that I have asked have been answered to my satisfaction.

Name of Participant:

Signature: Date:

Statement by Investigator

☐ I have explained the project & the implications of participation in it to this volunteer and I believe that the consent is informed and that he/she understands the implications of participation

If the Investigator has not had an opportunity to talk to participants prior to them participating, the following must be ticked.

☐ The participant has received the Information Sheet where my details have been provided so participants have the opportunity to contact me prior to consenting to participate in this project.

Name of investigator _____

Signature of investigator _____ Date _____

Appendix C3:

Declaration of Abstinence

Session Number: 1 2

Declaration of Abstinence Compliance

Participants are required to abstain from the following prior to the experimental sessions:

- No nicotine and illicit drugs for the duration of participation
- No alcohol for 24 hours
- No prescription medication for 24 hours
- No caffeine-containing products for 8 hours
- No food for 4 hours (preceded by a light meal not containing oil/dairy/caffeine)

I solemnly swear that I have complied with the above guidelines prior to this session.

Signature of participant: ..... Date: .....

Signature of experimenter: ..... Date: .....

Appendix C4:

Online Screening Questionnaire

2016 Energy Drink Alcohol Screener

Thank you for your interest in participating in this research. The purpose of this study is to investigate the impact of alcohol, with and without energy drinks, on cognitive performance through measurement of behavioural outcomes.

Participation will involve attending one 60 minute familiarisation session and two 270 minute experimental sessions at the Psychology Research Centre, Hobart campus, University of Tasmania. In each experimental session participants will consume multiple beverages with a combined maximum of three standard 250mL energy drinks, and/or a maximum of six standard alcoholic drinks. Participants will then complete computerised behavioural laboratory tasks. Breath alcohol concentration (BrAC) will be monitored and participants will complete several scales assessing their feeling of intoxication and impairment. At the end of each session, participants will remain at leisure at the Psychology Research Centre until two consecutive BrAC measurements of 0.03% or less are recorded. Upon completing the final session, participants will be reimbursed $80 (KHA111/112 students will receive up to 8 hours research credit plus monetary reimbursement for the remaining hours).

We are currently seeking healthy participants who:

- Are male OR female
- Are aged 18-35
- Have English as a first language
- Have completed Year 12
- Have normal or corrected-to-normal vision
- Have normal sleep patterns
- Have no history of any significant neurological condition, including epilepsy
- Have no significant current physical condition
- Have no current diagnosis of a significant psychological condition or intellectual disability
- Have consumed an energy drink in the last month
- Regularly consume caffeine (e.g., tea, coffee, chocolate)
- Regularly consume alcohol
- Are not regularly taking prescription medication

Are not currently using illicit drugs

Are able to attend the Hobart campus of the University of Tasmania for one 60 minute session and two 270 minute sessions, beginning at 9am or 1pm.

If you are still interested and eligible to participate in this research, please complete the following online screening questionnaire. Please note that all information will be kept confidential and securely stored. You can close this browser window at any point during the questionnaire if you are no longer interested in participating.

Once again, thank you for your interest in our research. We appreciate your assistance.

There are 66 questions in this survey

Demographics and Contact Details

What is your current age in years? *

Only numbers may be entered in this field.

Please write your answer here:_____

What is your sex? *

Please choose only one of the following:

- ○ Female
- ○ Male

In this question, we are referring to biological aspects only

Is English your first language? *

Please choose only one of the following:

- ○ Yes
- ○ No

Are you currently studying KHA111 Psychology A or KHA112 Psychology B and seeking research participation credit? *

Please choose only one of the following:

- ○ Yes
- ○ No

What was the highest grade of school you completed? *

Please choose only one of the following:

- ○ Grade 6
- ○ Grade 7
- ○ Grade 8
- ○ Grade 9
- ○ Grade 10
- ○ Grade 11
- ○ Grade 12
- ○ Grade 13
- ○ Other: _____

Are you currently studying for any further qualification(s)? *

Please choose only one of the following:

- ○ Yes
- ○ No

If yes, what qualification(s) are you currently studying for? *

Only answer this question if the following conditions are met:
Answer was 'Yes' at question '6 [q15]' (Are you currently studying for any

further qualification(s)?) Please choose all that apply:

- ☐ Trade Certificate
- ☐ Other Certificate (e.g., TAFE, Cert III)
- ☐ Associate or Undergraduate Diploma
- ☐ Bachelor Degree
- ☐ Graduate Diploma/Certificate
- ☐ Honours Degree
- ☐ Postgraduate Degree
- ☐ Other: _____

Have you completed any further qualifications? *

Please choose only one of the following:

- ○ Yes
- ○ No

What further education qualifications have you completed? *

Only answer this question if the following conditions are met:
Answer was 'Yes' at question '8 [q152]' (Have you completed any

further qualifications?) Please choose all that apply:

- ☐ Trade Certificate
- ☐ Other Certificate (e.g., TAFE, Cert III)
- ☐ Associate or Undergraduate Diploma
- ☐ Bachelor Degree
- ☐ Graduate Diploma/Certificate
- ☐ Honours Degree
- ☐ Postgraduate Degree
- ☐ Other: _____

What driver licence do you currently hold? *

Please choose only one of the following:

- ○ No driver licence
- ○ Learner licence
- ○ Provisional P1 licence
- ○ Provisional P2 licence

- ○ Full licence
- ○ Other: _____

What is your email address?

Please write your answer here:_____

What is the phone number which you are most easily reached on? *

Please write your answer here:_____

Medical History

Do you have any difficulties with vision? *

Please choose only one of the following:

- ○ Yes
- ○ No

If yes, are these difficulties corrected (i.e., glasses/contacts)? *

Only answer this question if the following conditions are met:
Answer was 'Yes' at question '13 [q21]' (Do you have any difficulties with vision?) Please choose only one of the following:

- ○ Yes
- ○ No

Do you have a sleep disorder or any sleeping difficulties? *

Please choose only one of the following:

- ○ Yes
- ○ No

On average, how many hours do you sleep on a: *

Please write your answer(s) here:

Weeknight: _____

Weekend: _____

Do you work night shifts (e.g., 10pm until 6am) or double shifts (e.g., 8am until midnight)? *

Please choose only one of the following:

- ○ Yes
- ○ No

If yes, how many times per week do you work night shifts/double shifts? *

Only answer this question if the following conditions are met:
Answer was 'Yes' at question '17 [q24]' (Do you work night shifts (e.g., 10pm until 6am) or double shifts (e.g., 8am until midnight)?)

Only numbers may be entered in this field.

Please write your answer here: _____

Have you ever had or are you now suffering from any of the following? *

Please choose the appropriate response for each item:

	Yes	Uncertain	No
Fits or convulsions	○	○	○
Epilepsy	○	○	○
Regular giddiness	○	○	○
Concussion	○	○	○
Severe head injury	○	○	○
Loss of consciousness	○	○	○
Diabetes	○	○	○
Hypertension	○	○	○
Gastro-oesophageal reflux condition	○	○	○
Heart condition	○	○	○
Substance abuse/dependence disorder	○	○	○

Do you have any other serious physical conditions? *

Please choose only one of the following:

- ○ Yes
- ○ No

Are you currently suffering from anxiety or depression? *

Please choose only one of the following:

- ○ Yes
- ○ No

Do you have any other serious mental health condition? *

Please choose only one of the following:

- ○ Yes
- ○ No

What is your approximate height in cm? Note that 1 foot = 30.5cm. Please write 'don't know' if not sure.*

Please write your answer here: _____

What is your approximate weight in kg? Please write 'don't know' if not sure. *

Please write your answer here: _____

K-10

These questions concern how you have been feeling over the past 30 days. Please indicate the response which best represents how you have been. Please be assured your answers will remain confidential.

During the last 30 days, about how often did you feel tired out for no good reason? *

Please choose only one of the following:

- None of the time
- A little of the time
- Some of the time
- Most of the time
- All of the time

During the last 30 days, about how often did you feel nervous? *

Please choose only one of the following:

- None of the time
- A little of the time
- Some of the time
- Most of the time
- All of the time

During the last 30 days, about how often did you feel so nervous that nothing could calm you down? *

Only answer this question if the following conditions are met:
Answer was 'All of the time' or 'Most of the time' or 'Some of the time' or 'A little of the time' at question '26 [r279q0]' (During the last 30 days, about how often did you feel nervous?) Please choose only one of the following:

- None of the time
- A little of the time
- Some of the time
- Most of the time
- All of the time

During the last 30 days, about how often did you feel hopeless? *

Please choose only one of the following:

- None of the time

- ○ A little of the time
- ○ Some of the time
- ○ Most of the time
- ○ All of the time

During the last 30 days, about how often did you feel restless or fidgety? *

Please choose only one of the following:

- ○ None of the time
- ○ A little of the time
- ○ Some of the time
- ○ Most of the time
- ○ All of the time

During the last 30 days, about how often did you feel so restless that you could not sit still? *

Only answer this question if the following conditions are met:
Answer was 'All of the time' or 'A little of the time' or 'Some of the time' or 'Most of the time' at question '29 [q35]' (During the last 30 days, about how often did you feel restless or fidgety?) Please choose only one of the following:

- ○ None of the time
- ○ A little of the time
- ○ Some of the time
- ○ Most of the time
- ○ All of the time

During the last 30 days, about how often did you feel depressed? *

Please choose only one of the following:

- ○ None of the time
- ○ A little of the time
- ○ Some of the time
- ○ Most of the time
- ○ All of the time

During the last 30 days, about how often did you feel that everything was an effort? *

Please choose only one of the following:

- ○ None of the time
- ○ A little of the time
- ○ Some of the time
- ○ Most of the time

- ○ All of the time

During the last 30 days, about how often did you feel so sad that nothing could cheer you up? *

Please choose only one of the following:

- ○ None of the time
- ○ A little of the time
- ○ Some of the time
- ○ Most of the time
- ○ All of the time

During the last 30 days, about how often did you feel worthless? *

Please choose only one of the following:

- ○ None of the time
- ○ A little of the time
- ○ Some of the time
- ○ Most of the time
- ○ All of the time

Attitudes to Driving Violations Scale

Please rate your agreement with the following statements where 1 = strongly agree and 5 = strongly disagree

These questions ask about your thoughts on driving*

Please choose the appropriate response for each item from strongly agree (1) to disagree (5):

- Decreasing the speed limit on highways is a good idea
- Even at night-time, on quiet roads, it is important to keep within the speed limit
- Drivers who cause accidents by reckless driving should be banned for life
- People should drive slower than the speed limit when it is raining
- Cars should never overtake in the left lane, even if a slow driver is blocking the right lane
- In towns where there are a lot of pedestrians the speed limit should be dropped to 30km/h
- Penalties for speeding should be more severe

Caffeine Use

Have you consumed any caffeinated products in the last WEEK (e.g., tea, coffee, chocolate drinks, cola, chocolate, energy drinks)?*

Please choose only one of the following:

- ○ Yes
- ○ No

How many caffeinated products would you have consumed in the last WEEK (e.g., two coffees and one tea = 3)? *

Only answer this question if the following conditions are met:
Answer was 'Yes' at question '36 [q41]' (Have you consumed any caffeinated products in the last WEEK (e.g., tea, coffee, chocolate drinks, cola, chocolate, energy drinks)?) Only numbers may be entered in this field.

Please write your answer here: _____

How many times on average in a DAY do you eat/drink the following caffeine containing products, from the time you wake up until the time you fall to sleep (e.g., 2 x 220ml tea = 2)?

Only answer this question if the following conditions are met:
Answer was 'Yes' at question '36 [q41]' (Have you consumed any caffeinated products in the last WEEK (e.g., tea, coffee, chocolate drinks, cola, chocolate, energy drinks)?) Please write your answer(s) here:

- Instant coffee (220mL)
- Instant coffee decaffeinated (220mL)
- Ground coffee long black style (220mL)
- Ground coffee cappuccino style (220mL)
- Ground coffee expression style (30mL)
- Decaffeinated ground coffee (220mL)
- Iced coffee (375mL)
- Tea (220mL)
- Hot chocolate drink (220mL)
- Chocolate milk (330mL)
- Cola soft drink (375mL)
- Cola soft drink (600mL)
- Milk chocolate bar (snack size or approximately 20g)
- Milk chocolate bar (standard size or approximately 50g)
- Milk chocolate bar (king size or approximately 80g)
- White chocolate (snack size or approximately 20g)

- Dark chocolate (snack size or approximately 20g)
- Chocolate biscuit (15g)
- Chocolate cake (75g)
- Energy drink (250mL)
- NoDoz (1 tablet)

ED Use

Have you consumed an energy drink in the past 30 days? *

Please choose only one of the following:

- ○ Yes
- ○ No

How frequently have you consumed an energy drink in the past 30 days? *

Only answer this question if the following conditions are met:
Answer was 'Yes' at question '39 [q51]' (Have you consumed an energy drink

in the past 30 days?)

Please choose only one of the following:

- ○ Monthly or less
- ○ 2 to 4 times per month
- ○ 2 to 3 times per week
- ○ 4 to 6 times per week
- ○ Daily

In the past 30 days, how many standard energy drinks did you have on a typical day when you were drinking energy drinks? Note: 1 standard ED = 250mL ED containing approximately 80mg caffeine (e.g., one serving of Red Bull). *

Only answer this question if the following conditions are met:
Answer was 'Yes' at question '39 [q51]' (Have you consumed an energy drink

in the past 30 days?) Only numbers may be entered in this field.

Please write your answer here: _____

In the last 30 days, how often did you drink three or more standard energy drinks in one day? *

Only answer this question if the following conditions are met:
Answer was 'Yes' at question '39 [q51]' (Have you consumed an energy drink

in the past 30 days?) Please choose only one of the following:

- ○ Never
- ○ Monthly or less

- ○ 2 to 4 times per month
- ○ 2 to 3 times per week
- ○ 4 to 6 times per week
- ○ Every day

In the last 30 days, what is the greatest number of standard energy drinks you have consumed in one day? *

Only answer this question if the following conditions are met:
Answer was 'Yes' at question '39 [q51]' (Have you consumed an energy drink

in the past 30 days?) Only numbers may be entered in this field.

Please write your answer here: _____

Alcohol Use

Have you consumed an alcoholic drink in the last fortnight (i.e., 14 days)? *

Please choose only one of the following:

- ○ Yes
- ○ No

How many standard alcoholic drinks have you consumed in the last fortnight? *

Only answer this question if the following conditions are met:
Answer was 'Yes' at question '44 [q61]' (Have you consumed an alcoholic drink in the last

fortnight (i.e., 14 days)?) Only numbers may be entered in this field.

Please write your answer here: _____

The following questions ask about your alcohol use in the last 12 months. Please note that all alcohol quantities are provided in standard drink sizes. All information provided will be kept confidential.

How often do you have a drink containing alcohol? *

Only answer this question if the following conditions are met:
Answer was 'Yes' at question '44 [q61]' (Have you consumed an alcoholic drink in the last

fortnight (i.e., 14 days)?) Please choose only one of the following:

- ○ Never
- ○ Monthly or less
- ○ 2 to 4 times a month
- ○ 2 to 3 times a week
- ○ 4 or more times a week

How many standard drinks containing alcohol do you have on a typical day when you are drinking? *

Only answer this question if the following conditions are met:
Answer was 'Yes' at question '44 [q61]' (Have you consumed an alcoholic drink in the last fortnight (i.e., 14 days)?) Please choose only one of the following:

- ○ 1 or 2
- ○ 3 or 4
- ○ 5 or 6
- ○ 7 to 9
- ○ 10 or more

How often do you have six or more standard drinks on one occasion? *

Only answer this question if the following conditions are met:
Answer was 'Yes' at question '44 [q61]' (Have you consumed an alcoholic drink in the last fortnight (i.e., 14 days)?) Please choose only one of the following:

- ○ Never
- ○ Less than monthly
- ○ Monthly
- ○ Weekly
- ○ Daily or almost daily

How often during the last year have you found that you were not able to stop drinking once you had started? *

Only answer this question if the following conditions are met:
Answer was 'Yes' at question '44 [q61]' (Have you consumed an alcoholic drink in the last fortnight (i.e., 14 days)?) Please choose only one of the following:

- ○ Never
- ○ Less than monthly
- ○ Monthly
- ○ Weekly
- ○ Daily or almost daily

How often during the last year have you failed to do what was normally expected of you because of drinking? *

Only answer this question if the following conditions are met:
Answer was 'Yes' at question '44 [q61]' (Have you consumed an alcoholic drink in the last fortnight (i.e., 14 days)?) Please choose only one of the following:

- ○ Never
- ○ Less than monthly
- ○ Monthly
- ○ Weekly
- ○ Daily or almost daily

How often during the last year have you needed a first drink in the morning to get yourself going after a heavy drinking session? *

Only answer this question if the following conditions are met:
Answer was 'Yes' at question '44 [q61]' (Have you consumed an alcoholic drink in the last fortnight (i.e., 14 days)?) Please choose only one of the following:

- ○ Never
- ○ Less than monthly
- ○ Monthly
- ○ Weekly
- ○ Daily or almost daily

How often during the last year have you had a feeling of guilt or remorse after drinking? *

Only answer this question if the following conditions are met:
Answer was 'Yes' at question '44 [q61]' (Have you consumed an alcoholic drink in the last fortnight (i.e., 14 days)?) Please choose only one of the following:

- ○ Never
- ○ Less than monthly
- ○ Monthly
- ○ Weekly
- ○ Daily or almost daily

How often during the last year have you been unable to remember what happened the night before because of your drinking? *

Only answer this question if the following conditions are met:
Answer was 'Yes' at question '44 [q61]' (Have you consumed an alcoholic drink in the last fortnight (i.e., 14 days)?) Please choose only one of the following:

- ○ Never
- ○ Less than monthly
- ○ Monthly
- ○ Weekly
- ○ Daily or almost daily

Have you or someone else ever been injured because of your drinking? *

Only answer this question if the following conditions are met:
Answer was 'Yes' at question '44 [q61]' (Have you consumed an alcoholic drink in the last fortnight (i.e., 14 days)?) Please choose only one of the following:

- ○ No
- ○ Yes, but not in the last year

- ○ Yes, in the last year

Has a relative or friend or a doctor or other health worker ever been concerned about your drinking or suggested you cut down? *

Only answer this question if the following conditions are met:
Answer was 'Yes' at question '44 [q61]' (Have you consumed an alcoholic drink in the last fortnight (i.e., 14 days)?) Please choose only one of the following:

- ○ No
- ○ Yes, but not in the last year
- ○ Yes, during the last year

Other Drug Use

How often do you smoke tobacco? *

Please choose only one of the following:

- ○ Never
- ○ Monthly
- ○ Fortnightly
- ○ Weekly
- ○ Daily or almost daily

Have you used cannabis in the past month? *

Please choose only one of the following:

- ○ Yes
- ○ No

Have you used any form of illicit drugs in the past 6 months? *

Please choose only one of the following:

- ○ Yes
- ○ No

Are you currently regularly taking prescription medication for medicinal or recreational

purposes? *

Please choose only one of the following:

- ○ Yes

- ○ No

Have you participated in another study within the last three months for which you had to consume any drugs? *

Please choose only one of the following:

- ○ Yes
- ○ No

Statement of Study Restrictions

Thank you for answering the previous questions. There are now just a few questions to ensure you are aware of what participation involves and to ensure that you will be able to complete the study.

Will you be able to attend one 60minute familiarisation session and two 240minute experimental sessions at the Hobart campus of the University of Tasmania, beginning at either 9am or 1pm? *

Please choose only one of the following:

- ○ Yes
- ○ No

Are you willing to drink up to six standard alcoholic drinks and three 250mL energy drinks per session? Please note that you will not be informed of the specific quantity of alcohol/energy drink administered in the beverage until the conclusion of all sessions. *

Please choose only one of the following:

- ○ Yes
- ○ No

Prior to each experimental session, participants will be asked to abstain from:

- Food for 4 hours

- Caffeine for 8 hours

- Alcohol for 24 hours

- Prescription medication for 24 hours

- Illicit drugs for the duration of participation

Participants will be provided with a standard breakfast or lunch snack to eat 60 minutes prior to each session. Food and drink will also be provided at the end of each session.

Will you be willing to comply with these restrictions? *

Please choose only one of the following:

- ○ Yes

- ○ No

Are you willing to remain in the laboratory until your breath alcohol concentration is recorded at .03% or less?

Provisional licence holders who are intending to drive will have to remain in the laboratory until their breath alcohol concentration is .00%.

If not intending to drive provisional licence holders will have to remain in the laboratory until their breath alcohol concentration reaches .03% and be required to organise alternative transportation after the session.

In addition to food and drink, DVDs and magazines will be provided in the interim. *

Please choose only one of the following:

- ○ Yes
- ○ No

Which session time would you prefer? *

Please choose all that apply:

- ☐ 9am
- ☐ 1pm

Please indicate which days would best suit you for completing the experimental sessions. Note that the 270 minute sessions will begin at 9am or 1pm and will be separated by a minimum of 4 and maximum of 10 days.

Please choose all that apply:

- ☐ Monday
- ☐ Tuesday
- ☐ Wednesday
- ☐ Thursday
- ☐ Friday
- ☐ Saturday
- ☐ Sunday

Thank you answering the screening questionnaire, we appreciate your assistance. The researchers will be in contact with you as quickly as possible to confirm whether you are eligible to participate. Please email Holly Bromfield and Xiao Min Leong at energydrinkstudy@gmail.com if you have any queries or would like a copy of the information sheet.

Submit your survey.

Thank you for completing this survey.

Appendix D. SPSS Output

Appendix D1: Objective Intoxication (BrAC%)

Appendix D2: Subjective Effects Scale (SES)

Appendix D3: The Biphasic Alcohol Effects Scale (BAES)

Appendix D4: Bivariate Correlations

Appendix D5: The Beverage Rating Scale (BRS)

Appendix D1:

Objective Intoxication (BrAC%)

F-statistics

Type III Tests of Fixed Effects[a]

Source	Numerator df	Denominator df	F	Sig.
Intercept	1	26.592	440.567	.000
Sex	1	26.589	38.395	.000
Session	1	621.586	72.668	.000
Condition	1	647.913	220.618	.000
Time	18	77.452	132.312	.000
Condition * Time	18	77.455	2.215	.009
Condition * Sex	1	636.340	8.478	.004
Time * Sex	18	76.337	16.658	.000
Condition * Time * Sex	18	75.549	2.149	.011

a. Dependent Variable: BrAC.

The Mean of BrAC for the Alcohol (Condition 0) and the AmED (Condition 1) Conditions at Each Time-Point

Estimates[a]

Condition	Time	Sex	Mean	Std. Error	df	95% Confidence Interval	
						Lower Bound	Upper Bound
Condition 0	.00	Male	-.002	.003	41.926	-.008	.005
		Female	.003	.003	40.501	-.004	.009
	1.00	Male	.018	.004	42.534	.010	.025
		Female	.028	.004	39.212	.020	.036
	2.00	Male	.022	.003	43.616	.016	.028
		Female	.029	.003	47.039	.022	.035
	3.00	Male	.021	.003	38.467	.015	.026
		Female	.031	.003	41.019	.025	.036
	4.00	Male	.034	.003	45.775	.028	.040
		Female	.045	.003	48.779	.039	.051
	5.00	Male	.028	.003	37.527	.023	.033
		Female	.048	.003	39.202	.042	.053
	6.00	Male	.026	.003	40.472	.021	.032
		Female	.043	.003	42.807	.037	.049
	7.00	Male	.035	.003	44.859	.028	.041
		Female	.057	.003	48.268	.050	.064
	8.00	Male	.033	.003	44.257	.027	.039
		Female	.057	.003	47.254	.051	.064
	9.00	Male	.031	.003	48.123	.025	.037
		Female	.058	.003	47.801	.052	.064
	10.00	Male	.043	.003	43.631	.036	.050
		Female	.072	.004	49.293	.065	.080
	11.00	Male	.038	.003	44.387	.032	.045
		Female	.069	.004	48.426	.062	.076
	12.00	Male	.036	.003	50.671	.029	.042
		Female	.066	.003	50.463	.060	.073
	13.00	Male	.033	.004	50.694	.026	.040
		Female	.063	.004	49.241	.056	.070
	14.00	Male	.031	.003	48.944	.025	.037
		Female	.058	.003	47.523	.052	.064
	15.00	Male	.029	.003	43.964	.023	.034
		Female	.061	.003	42.008	.055	.067
	16.00	Male	.024	.003	50.326	.018	.031
		Female	.055	.003	50.847	.048	.061
	17.00	Male	.025	.003	45.874	.019	.031
		Female	.057	.003	43.562	.051	.063
	18.00	Male	.022	.003	46.741	.016	.028
		Female	.052	.003	44.398	.046	.058
Condition 1	.00	Male	.002	.003	43.493	-.005	.009
		Female	.002	.003	40.252	-.005	.009
	1.00	Male	.014	.003	42.819	.007	.020
		Female	.025	.003	40.734	.019	.032
	2.00	Male	.014	.003	44.890	.008	.020
		Female	.026	.003	42.482	.020	.033
	3.00	Male	.015	.003	41.000	.010	.021
		Female	.027	.003	39.186	.021	.033
	4.00	Male	.022	.003	44.020	.016	.027
		Female	.040	.003	41.710	.034	.046
	5.00	Male	.022	.003	43.114	.016	.027
		Female	.038	.003	42.430	.032	.044
	6.00	Male	.020	.003	39.643	.015	.025
		Female	.039	.003	39.239	.034	.045
	7.00	Male	.030	.003	47.772	.024	.036
		Female	.052	.003	47.214	.045	.058
	8.00	Male	.027	.003	38.903	.022	.033
		Female	.050	.003	37.311	.045	.056
	9.00	Male	.024	.003	39.367	.019	.029
		Female	.051	.003	39.521	.045	.056
	10.00	Male	.038	.003	47.913	.032	.044
		Female	.059	.003	45.769	.053	.066
	11.00	Male	.035	.003	38.245	.030	.040
		Female	.062	.003	39.816	.057	.068
	12.00	Male	.030	.002	33.418	.025	.035
		Female	.058	.003	33.526	.053	.064
	13.00	Male	.027	.003	42.180	.021	.032
		Female	.054	.003	40.022	.048	.059
	14.00	Male	.025	.003	44.224	.019	.030
		Female	.048	.003	42.481	.042	.054
	15.00	Male	.023	.003	42.886	.017	.028
		Female	.045	.003	41.057	.039	.051
	16.00	Male	.022	.003	36.744	.016	.027
		Female	.044	.003	35.280	.038	.049
	17.00	Male	.020	.003	40.733	.014	.025
		Female	.040	.003	39.276	.034	.046
	18.00	Male	.018	.003	48.719	.012	.025
		Female	.038	.003	50.422	.032	.045

a. Dependent Variable: BrAC.

Pairwise Comparison of the BrAC between the Alcohol (Condition 0) and the AmED (Condition 1) Conditions in Males and Females Across Each Time-Point

Pairwise Comparisons[a]

Time	Sex	(I) Condition	(J) Condition	Mean Difference (I-J)	Std. Error	df	Sig.[c]	95% Confidence Interval for Difference[c]	
								Lower Bound	Upper Bound
.00	Male	Condition 0	Condition 1	-.003	.003	36.865	.305	-.010	.003
		Condition 1	Condition 0	.003	.003	36.865	.305	-.003	.010
	Female	Condition 0	Condition 1	.001	.003	32.403	.876	-.006	.007
		Condition 1	Condition 0	-.001	.003	32.403	.876	-.007	.006
1.00	Male	Condition 0	Condition 1	.004	.004	39.001	.312	-.004	.012
		Condition 1	Condition 0	-.004	.004	39.001	.312	-.012	.004
	Female	Condition 0	Condition 1	.003	.004	33.758	.433	-.005	.011
		Condition 1	Condition 0	-.003	.004	33.758	.433	-.011	.005
2.00	Male	Condition 0	Condition 1	.007*	.003	39.499	.008	.002	.013
		Condition 1	Condition 0	-.007*	.003	39.499	.008	-.013	-.002
	Female	Condition 0	Condition 1	.002	.003	40.879	.433	-.003	.008
		Condition 1	Condition 0	-.002	.003	40.879	.433	-.008	.003
3.00	Male	Condition 0	Condition 1	.005*	.002	35.114	.015	.001	.010
		Condition 1	Condition 0	-.005*	.002	35.114	.015	-.010	-.001
	Female	Condition 0	Condition 1	.004	.002	37.008	.096	-.001	.008
		Condition 1	Condition 0	-.004	.002	37.008	.096	-.008	.001
4.00	Male	Condition 0	Condition 1	.012*	.003	40.011	.000	.007	.017

		Condition 1	Condition 0	-.012*	.003	40.011	.000	-.017	-.007
	Female	Condition 0	Condition 1	.005	.003	40.824	.066	.000	.010
		Condition 1	Condition 0	-.005	.003	40.824	.066	-.010	.000
5.00	Male	Condition 0	Condition 1	.006*	.002	38.325	.003	.002	.010
		Condition 1	Condition 0	-.006*	.002	38.325	.003	-.010	-.002
	Female	Condition 0	Condition 1	.009*	.002	40.298	.000	.005	.014
		Condition 1	Condition 0	-.009*	.002	40.298	.000	-.014	-.005
6.00	Male	Condition 0	Condition 1	.007*	.002	40.717	.003	.002	.011
		Condition 1	Condition 0	-.007*	.002	40.717	.003	-.011	-.002
	Female	Condition 0	Condition 1	.004	.002	43.174	.085	-.001	.008
		Condition 1	Condition 0	-.004	.002	43.174	.085	-.008	.001
7.00	Male	Condition 0	Condition 1	.005	.003	41.884	.117	-.001	.010
		Condition 1	Condition 0	-.005	.003	41.884	.117	-.010	.001
	Female	Condition 0	Condition 1	.006	.003	44.836	.078	-.001	.012
		Condition 1	Condition 0	-.006	.003	44.836	.078	-.012	.001
8.00	Male	Condition 0	Condition 1	.006*	.002	35.352	.010	.002	.011
		Condition 1	Condition 0	-.006*	.002	35.352	.010	-.011	-.002
	Female	Condition 0	Condition 1	.007*	.002	37.074	.005	.002	.012
		Condition 1	Condition 0	-.007*	.002	37.074	.005	-.012	-.002
9.00	Male	Condition 0	Condition 1	.007*	.002	45.439	.002	.003	.012
		Condition 1	Condition 0	-.007*	.002	45.439	.002	-.012	-.003
	Female	Condition 0	Condition 1	.007*	.002	45.341	.003	.003	.012
		Condition 1	Condition 0	-.007*	.002	45.341	.003	-.012	-.003
10.00	Male	Condition 0	Condition 1	.005	.003	38.349	.113	-.001	.012

		Condition 1	Condition 0	-.005	.003	38.349	.113	-.012	.001
	Female	Condition 0	Condition 1	.013*	.003	42.235	.000	.006	.020
		Condition 1	Condition 0	-.013*	.003	42.235	.000	-.020	-.006
11.00	Male	Condition 0	Condition 1	.003	.003	30.511	.224	-.002	.009
		Condition 1	Condition 0	-.003	.003	30.511	.224	-.009	.002
	Female	Condition 0	Condition 1	.006*	.003	35.362	.039	.000	.012
		Condition 1	Condition 0	-.006*	.003	35.362	.039	-.012	.000
12.00	Male	Condition 0	Condition 1	.006*	.002	33.079	.026	.001	.010
		Condition 1	Condition 0	-.006*	.002	33.079	.026	-.010	-.001
	Female	Condition 0	Condition 1	.008*	.002	33.148	.003	.003	.013
		Condition 1	Condition 0	-.008*	.002	33.148	.003	-.013	-.003
13.00	Male	Condition 0	Condition 1	.006*	.003	40.302	.049	2.593E-5	.012
		Condition 1	Condition 0	-.006*	.003	40.302	.049	-.012	-2.593E-5
	Female	Condition 0	Condition 1	.009*	.003	37.042	.005	.003	.015
		Condition 1	Condition 0	-.009*	.003	37.042	.005	-.015	-.003
14.00	Male	Condition 0	Condition 1	.007*	.002	46.855	.008	.002	.011
		Condition 1	Condition 0	-.007*	.002	46.855	.008	-.011	-.002
	Female	Condition 0	Condition 1	.010*	.002	42.668	.000	.005	.015
		Condition 1	Condition 0	-.010*	.002	42.668	.000	-.015	-.005
15.00	Male	Condition 0	Condition 1	.006*	.002	45.165	.008	.002	.011
		Condition 1	Condition 0	-.006*	.002	45.165	.008	-.011	-.002
	Female	Condition 0	Condition 1	.016*	.002	40.305	.000	.011	.020
		Condition 1	Condition 0	-.016*	.002	40.305	.000	-.020	-.011
16.00	Male	Condition 0	Condition 1	.003	.002	37.176	.255	-.002	.008

		Condition 1	Condition 0	-.003	.002	37.176	.255	-.008	.002
	Female	Condition 0	Condition 1	.011*	.002	36.513	.000	.006	.016
		Condition 1	Condition 0	-.011*	.002	36.513	.000	-.016	-.006
17.00	Male	Condition 0	Condition 1	.005*	.002	40.917	.018	.001	.010
		Condition 1	Condition 0	-.005*	.002	40.917	.018	-.010	-.001
	Female	Condition 0	Condition 1	.017*	.002	36.668	.000	.013	.021
		Condition 1	Condition 0	-.017*	.002	36.668	.000	-.021	-.013
18.00	Male	Condition 0	Condition 1	.004	.003	44.188	.154	-.002	.010
		Condition 1	Condition 0	-.004	.003	44.188	.154	-.010	.002
	Female	Condition 0	Condition 1	.014*	.003	43.956	.000	.008	.020
		Condition 1	Condition 0	-.014*	.003	43.956	.000	-.020	-.008

Based on estimated marginal means

*. The mean difference is significant at the .05 level.

a. Dependent Variable: BrAC.

c. Adjustment for multiple comparisons: Least Significant Difference (equivalent to no adjustments).

Appendix D2:

Subjective Effects Scale (SES)

F-statistics for Subjective Intoxication Rating

Type III Tests of Fixed Effects[a]

Source	Numerator df	Denominator df	F	Sig.
Intercept	1	46.495	14.727	.000
Sex	1	27.725	.017	.898
Session	1	681.630	1.303	.254
Condition	1	734.457	47.100	.000
Time	18	80.515	3.770	.000
Condition * Time	18	73.891	1.536	.102
Condition * Sex	1	670.205	4.841	.028
Time * Sex	18	73.890	4.369	.000
Condition * Time * Sex	18	72.366	.448	.971
BrAC	1	547.608	27.803	.000

a. Dependent Variable: SES_Intox.

The Mean of Subjective Intoxication Rating at Each Time-Point

2. Time[a]

Time	Mean	Std. Error	df	95% Confidence Interval	
				Lower Bound	Upper Bound
.00	11.132[b]	4.433	63.688	2.275	19.989
1.00	17.642[b]	3.915	42.735	9.746	25.538
2.00	21.006[b]	4.059	46.910	12.840	29.172
3.00	20.947[b]	3.897	41.860	13.082	28.812
4.00	24.120[b]	3.785	38.066	16.459	31.782
5.00	28.452[b]	3.976	43.758	20.438	36.466
6.00	23.652[b]	3.759	37.044	16.035	31.269
7.00	29.944[b]	3.822	39.474	22.216	37.673
8.00	29.164[b]	3.750	37.542	21.570	36.757
9.00	28.007[b]	3.847	41.459	20.240	35.774
10.00	32.885[b]	3.896	44.199	25.034	40.736
11.00	32.535[b]	4.053	50.246	24.396	40.675
12.00	32.772[b]	3.939	45.540	24.841	40.702
13.00	28.845[b]	3.827	41.321	21.117	36.572
14.00	31.843[b]	4.049	48.533	23.704	39.983
15.00	28.125[b]	3.918	43.308	20.226	36.024
16.00	23.710[b]	3.827	39.349	15.971	31.449
17.00	22.089[b]	3.817	39.212	14.370	29.808
18.00	19.360[b]	3.785	38.293	11.701	27.020

a. Dependent Variable: SES_Intox.

b. Covariates appearing in the model are evaluated at the following values: BrAC = .03543.

The Mean of Subjective Intoxication Rating for the Alcohol (Condition 0) and the AmED (Condition 1) Conditions at Each Time-Point

Estimates[a]

Condition	Time	Mean	Std. Error	df	95% Confidence Interval	
					Lower Bound	Upper Bound
Condition 0	.00	9.468[b]	5.094	58.981	-.725	19.662
	1.00	19.106[b]	4.419	48.125	10.221	27.991
	2.00	24.392[b]	4.916	49.959	14.518	34.265
	3.00	22.332[b]	4.391	47.434	13.500	31.164
	4.00	27.572[b]	4.358	44.324	18.791	36.353
	5.00	33.639[b]	5.123	48.632	23.343	43.935
	6.00	26.870[b]	4.395	44.210	18.013	35.727
	7.00	37.508[b]	4.736	48.546	27.988	47.028
	8.00	35.418[b]	4.502	48.323	26.368	44.467
	9.00	31.916[b]	4.708	52.093	22.470	41.362
	10.00	40.272[b]	4.606	54.757	31.040	49.504
	11.00	36.704[b]	4.717	55.265	27.253	46.156
	12.00	37.653[b]	4.515	52.549	28.595	46.711
	13.00	31.681[b]	4.309	49.327	23.022	40.339
	14.00	33.998[b]	4.809	51.464	24.346	43.650
	15.00	30.624[b]	4.820	50.085	20.942	40.305
	16.00	27.111[b]	4.644	48.998	17.779	36.443
	17.00	23.689[b]	4.730	49.564	14.187	33.192
	18.00	19.558[b]	4.552	48.519	10.408	28.708
Condition 1	.00	12.797[b]	4.788	53.038	3.194	22.399
	1.00	16.178[b]	4.233	46.091	7.659	24.697
	2.00	17.620[b]	4.246	45.973	9.074	26.167
	3.00	19.562[b]	4.223	44.509	11.053	28.070
	4.00	20.669[b]	3.969	41.808	12.658	28.680
	5.00	23.266[b]	3.798	38.189	15.578	30.953
	6.00	20.434[b]	3.813	37.176	12.708	28.159
	7.00	22.381[b]	3.605	32.752	15.044	29.718
	8.00	22.910[b]	3.625	33.098	15.535	30.285
	9.00	24.098[b]	3.781	38.078	16.445	31.751
	10.00	25.498[b]	3.858	42.157	17.713	33.283
	11.00	28.366[b]	4.394	52.150	19.550	37.182
	12.00	27.891[b]	4.263	48.450	19.321	36.461
	13.00	26.008[b]	4.125	46.963	17.709	34.308
	14.00	29.689[b]	4.447	49.922	20.756	38.621
	15.00	25.627[b]	3.954	42.482	17.651	33.604
	16.00	20.309[b]	3.806	35.199	12.584	28.035
	17.00	20.489[b]	3.670	34.511	13.035	27.943
	18.00	19.163[b]	3.748	36.269	11.564	26.761

a. Dependent Variable: SES_Intox.

b. Covariates appearing in the model are evaluated at the following values: BrAC = .03543.

Pairwise Comparison for Subjective Intoxication Rating between the Alcohol (Condition 0) and the AmED (Condition 1) Conditions for Each Time-Point

Pairwise Comparisons[a]

Time	(I) Condition	(J) Condition	Mean Difference (I-J)	Std. Error	df	Sig.[c]	95% Confidence Interval for Difference[c]	
							Lower Bound	Upper Bound
.00	Condition 0	Condition 1	-3.328	4.374	34.907	.452	-12.210	5.553
	Condition 1	Condition 0	3.328	4.374	34.907	.452	-5.553	12.210
1.00	Condition 0	Condition 1	2.928	3.687	42.195	.432	-4.512	10.368
	Condition 1	Condition 0	-2.928	3.687	42.195	.432	-10.368	4.512
2.00	Condition 0	Condition 1	6.771	4.299	42.083	.123	-1.903	15.446
	Condition 1	Condition 0	-6.771	4.299	42.083	.123	-15.446	1.903
3.00	Condition 0	Condition 1	2.770	3.673	41.970	.455	-4.642	10.183
	Condition 1	Condition 0	-2.770	3.673	41.970	.455	-10.183	4.642
4.00	Condition 0	Condition 1	6.903	3.492	43.046	.055	-.139	13.945
	Condition 1	Condition 0	-6.903	3.492	43.046	.055	-13.945	.139
5.00	Condition 0	Condition 1	10.373*	4.255	36.204	.020	1.746	19.001
	Condition 1	Condition 0	-10.373*	4.255	36.204	.020	-19.001	-1.746
6.00	Condition 0	Condition 1	6.437	3.345	34.779	.063	-.355	13.228
	Condition 1	Condition 0	-6.437	3.345	34.779	.063	-13.228	.355
7.00	Condition 0	Condition 1	15.127*	3.525	28.728	.000	7.915	22.338
	Condition 1	Condition 0	-15.127*	3.525	28.728	.000	-22.338	-7.915
8.00	Condition 0	Condition 1	12.508*	3.252	30.240	.001	5.869	19.146
	Condition 1	Condition 0	-12.508*	3.252	30.240	.001	-19.146	-5.869
9.00	Condition 0	Condition 1	7.818*	3.702	36.461	.042	.313	15.323
	Condition 1	Condition 0	-7.818*	3.702	36.461	.042	-15.323	-.313
10.00	Condition 0	Condition 1	14.774*	3.389	33.822	.000	7.884	21.663
	Condition 1	Condition 0	-14.774*	3.389	33.822	.000	-21.663	-7.884
11.00	Condition 0	Condition 1	8.338	4.171	47.862	.051	-.048	16.725
	Condition 1	Condition 0	-8.338	4.171	47.862	.051	-16.725	.048
12.00	Condition 0	Condition 1	9.762*	3.882	45.961	.015	1.949	17.576
	Condition 1	Condition 0	-9.762*	3.882	45.961	.015	-17.576	-1.949
13.00	Condition 0	Condition 1	5.672	3.548	47.381	.117	-1.464	12.809
	Condition 1	Condition 0	-5.672	3.548	47.381	.117	-12.809	1.464
14.00	Condition 0	Condition 1	4.309	4.495	50.752	.342	-4.717	13.335
	Condition 1	Condition 0	-4.309	4.495	50.752	.342	-13.335	4.717
15.00	Condition 0	Condition 1	4.996	4.043	41.742	.223	-3.164	13.156
	Condition 1	Condition 0	-4.996	4.043	41.742	.223	-13.156	3.164
16.00	Condition 0	Condition 1	6.802	3.676	36.375	.072	-.651	14.254
	Condition 1	Condition 0	-6.802	3.676	36.375	.072	-14.254	.651
17.00	Condition 0	Condition 1	3.200	3.662	35.230	.388	-4.231	10.632
	Condition 1	Condition 0	-3.200	3.662	35.230	.388	-10.632	4.231
18.00	Condition 0	Condition 1	.395	3.498	36.689	.911	-6.695	7.486
	Condition 1	Condition 0	-.395	3.498	36.689	.911	-7.486	6.695

Based on estimated marginal means

*. The mean difference is significant at the .05 level.

a. Dependent Variable: SES_Intox.

c. Adjustment for multiple comparisons: Least Significant Difference (equivalent to no adjustments).

The Mean of Subjective Intoxication Rating Between Males and Females in the Alcohol (Condition 0) and the AmED (Condition 1) Conditions

Estimates[a]

Condition	Sex	Mean	Std. Error	df	95% Confidence Interval	
					Lower Bound	Upper Bound
Condition 0	Male	27.481[b]	4.794	28.025	17.661	37.301
	Female	30.362[b]	5.023	29.098	20.091	40.633
Condition 1	Male	22.808[b]	4.783	27.815	13.008	32.607
	Female	21.714[b]	4.919	26.854	11.617	31.810

a. Dependent Variable: SES_Intox.

b. Covariates appearing in the model are evaluated at the following values: BrAC = .03543.

Pairwise Comparison for Subjective Intoxication Rating between the Alcohol (Condition 0) and the AmED (Condition 1) Conditions for Males and Females

Pairwise Comparisons[a]

Sex	(I) Condition	(J) Condition	Mean Difference (I-J)	Std. Error	df	Sig.[c]	95% Confidence Interval for Difference[c]	
							Lower Bound	Upper Bound
Male	Condition 0	Condition 1	4.673*	1.276	682.331	.000	2.168	7.178
	Condition 1	Condition 0	-4.673*	1.276	682.331	.000	-7.178	-2.168
Female	Condition 0	Condition 1	8.649*	1.374	729.417	.000	5.951	11.347
	Condition 1	Condition 0	-8.649*	1.374	729.417	.000	-11.347	-5.951

Based on estimated marginal means

*. The mean difference is significant at the .05 level.

a. Dependent Variable: SES_Intox.

c. Adjustment for multiple comparisons: Least Significant Difference (equivalent to no adjustments).

The Mean of Subjective Intoxication Rating for Males and Females at Each Time-Point

Estimates[a]

Sex	Time	Mean	Std. Error	df	95% Confidence Interval	
					Lower Bound	Upper Bound
Male	.00	14.619[b]	5.997	56.688	2.608	26.629
	1.00	22.800[b]	5.447	42.924	11.815	33.784
	2.00	25.525[b]	5.606	45.641	14.238	36.813
	3.00	25.746[b]	5.427	42.257	14.796	36.696
	4.00	28.139[b]	5.261	38.303	17.493	38.786
	5.00	33.337[b]	5.545	44.549	22.165	44.508
	6.00	25.331[b]	5.248	37.856	14.707	35.956
	7.00	30.259[b]	5.248	37.888	19.633	40.884
	8.00	30.080[b]	5.170	36.630	19.602	40.558
	9.00	29.346[b]	5.333	41.287	18.579	40.114
	10.00	30.357[b]	5.199	38.012	19.832	40.883
	11.00	30.661[b]	5.480	45.422	19.628	41.695
	12.00	29.568[b]	5.383	42.984	18.711	40.424
	13.00	24.315[b]	5.290	40.717	13.630	35.001
	14.00	22.852[b]	5.627	48.739	11.542	34.162
	15.00	20.843[b]	5.456	44.043	9.846	31.839
	16.00	18.769[b]	5.367	40.799	7.929	29.608
	17.00	18.464[b]	5.367	41.177	7.627	29.300
	18.00	16.735[b]	5.329	40.405	5.968	27.501
Female	.00	7.646[b]	5.957	49.778	-4.321	19.613
	1.00	12.485[b]	5.521	39.443	1.321	23.648
	2.00	16.487[b]	5.785	45.069	4.836	28.137
	3.00	16.148[b]	5.519	39.294	4.987	27.308
	4.00	20.101[b]	5.472	38.579	9.029	31.173
	5.00	23.568[b]	5.742	44.227	11.997	35.139
	6.00	21.972[b]	5.421	37.156	10.989	32.956
	7.00	29.630[b]	5.588	41.777	18.351	40.910
	8.00	28.248[b]	5.481	39.670	17.168	39.327
	9.00	26.668[b]	5.633	44.115	15.317	38.018
	10.00	35.413[b]	5.713	47.376	23.922	46.905
	11.00	34.409[b]	5.949	53.943	22.481	46.338
	12.00	35.976[b]	5.797	49.393	24.329	47.623
	13.00	33.374[b]	5.605	43.998	22.077	44.671
	14.00	40.834[b]	5.899	50.646	28.990	52.679
	15.00	35.408[b]	5.717	45.340	23.896	46.920
	16.00	28.651[b]	5.559	40.773	17.422	39.881
	17.00	25.714[b]	5.524	40.010	14.550	36.878
	18.00	21.986[b]	5.452	38.403	10.953	33.019

a. Dependent Variable: SES_Intox.

b. Covariates appearing in the model are evaluated at the following values: BrAC = .03543.

Pairwise Comparison for Subjective Intoxication Rating between Males and Females at Each Time-Point

Pairwise Comparisons[a]

Time	(I) Sex	(J) Sex	Mean Difference (I-J)	Std. Error	df	Sig.[c]	95% Confidence Interval for Difference[c]	
							Lower Bound	Upper Bound
.00	Male	Female	6.973	8.019	43.448	.389	-9.193	23.140
	Female	Male	-6.973	8.019	43.448	.389	-23.140	9.193
1.00	Male	Female	10.315	7.681	39.622	.187	-5.214	25.844
	Female	Male	-10.315	7.681	39.622	.187	-25.844	5.214
2.00	Male	Female	9.038	7.993	44.138	.264	-7.068	25.145
	Female	Male	-9.038	7.993	44.138	.264	-25.145	7.068
3.00	Male	Female	9.599	7.686	39.655	.219	-5.939	25.136
	Female	Male	-9.599	7.686	39.655	.219	-25.136	5.939
4.00	Male	Female	8.038	7.611	38.867	.297	-7.359	23.435
	Female	Male	-8.038	7.611	38.867	.297	-23.435	7.359
5.00	Male	Female	9.769	8.013	45.139	.229	-6.369	25.907
	Female	Male	-9.769	8.013	45.139	.229	-25.907	6.369
6.00	Male	Female	3.359	7.571	37.961	.660	-11.969	18.687
	Female	Male	-3.359	7.571	37.961	.660	-18.687	11.969
7.00	Male	Female	.628	7.689	40.349	.935	-14.907	16.163
	Female	Male	-.628	7.689	40.349	.935	-16.163	14.907
8.00	Male	Female	1.832	7.569	38.874	.810	-13.479	17.143
	Female	Male	-1.832	7.569	38.874	.810	-17.143	13.479
9.00	Male	Female	2.679	7.818	44.125	.733	-13.076	18.434
	Female	Male	-2.679	7.818	44.125	.733	-18.434	13.076
10.00	Male	Female	-5.056	7.658	41.399	.513	-20.516	10.404
	Female	Male	5.056	7.658	41.399	.513	-10.404	20.516
11.00	Male	Female	-3.748	8.071	49.440	.644	-19.963	12.467
	Female	Male	3.748	8.071	49.440	.644	-12.467	19.963
12.00	Male	Female	-6.408	7.944	47.073	.424	-22.389	9.572
	Female	Male	6.408	7.944	47.073	.424	-9.572	22.389
13.00	Male	Female	-9.059	7.760	43.538	.249	-24.703	6.585
	Female	Male	9.059	7.760	43.538	.249	-6.585	24.703
14.00	Male	Female	-17.982*	8.206	51.048	.033	-34.455	-1.508
	Female	Male	17.982*	8.206	51.048	.033	1.508	34.455
15.00	Male	Female	-14.566	7.970	46.261	.074	-30.605	1.474
	Female	Male	14.566	7.970	46.261	.074	-1.474	30.605
16.00	Male	Female	-9.883	7.799	42.273	.212	-25.619	5.853
	Female	Male	9.883	7.799	42.273	.212	-5.853	25.619
17.00	Male	Female	-7.251	7.769	41.989	.356	-22.929	8.428
	Female	Male	7.251	7.769	41.989	.356	-8.428	22.929
18.00	Male	Female	-5.251	7.678	40.489	.498	-20.763	10.261
	Female	Male	5.251	7.678	40.489	.498	-10.261	20.763

Based on estimated marginal means

*. The mean difference is significant at the .05 level.

a. Dependent Variable: SES_Intox.

c. Adjustment for multiple comparisons: Least Significant Difference (equivalent to no adjustments).

F-Statistics for Impairment Rating

Type III Tests of Fixed Effects[a]

Source	Numerator df	Denominator df	F	Sig.
Intercept	1	44.831	19.357	.000
Sex	1	28.152	.000	.995
Session	1	612.243	.058	.810
Condition	1	671.875	46.479	.000
Time	18	78.367	5.976	.000
Condition * Time	18	76.823	1.933	.025
Condition * Sex	1	636.472	1.208	.272
Time * Sex	18	73.083	3.758	.000
Condition * Time * Sex	18	73.537	.707	.793
BrAC	1	401.716	13.248	.000

a. Dependent Variable: SES_Impairment.

The Mean of Impairment Rating for the Alcohol (Condition 0) and the AmED (Condition 1) Conditions

1. Condition[a]

Condition	Mean	Std. Error	df	95% Confidence Interval	
				Lower Bound	Upper Bound
Condition 0	22.767[b]	2.883	28.683	16.869	28.665
Condition 1	17.132[b]	2.843	27.164	11.300	22.964

a. Dependent Variable: SES_Impairment.

b. Covariates appearing in the model are evaluated at the following values: BrAC = .03543.

The Mean of Impairment Rating at Each Time-Point

2. Time[a]

Time	Mean	Std. Error	df	95% Confidence Interval	
				Lower Bound	Upper Bound
.00	8.064[b]	3.631	62.221	.807	15.321
1.00	11.393[b]	3.452	50.347	4.460	18.326
2.00	15.133[b]	3.487	51.387	8.133	22.133
3.00	14.697[b]	3.139	38.713	8.345	21.049
4.00	17.915[b]	3.193	40.631	11.464	24.366
5.00	23.982[b]	3.227	42.218	17.470	30.494
6.00	20.017[b]	3.124	38.095	13.693	26.342
7.00	23.086[b]	3.396	47.870	16.257	29.915
8.00	24.814[b]	3.329	45.800	18.113	31.515
9.00	21.595[b]	3.259	43.866	15.027	28.164
10.00	25.676[b]	3.382	50.078	18.884	32.469
11.00	25.598[b]	3.468	52.748	18.641	32.556
12.00	26.917[b]	3.354	47.711	20.173	33.660
13.00	21.865[b]	3.103	37.996	15.584	28.146
14.00	25.932[b]	3.283	44.526	19.318	32.546
15.00	22.937[b]	3.275	43.558	16.335	29.540
16.00	18.767[b]	3.174	40.141	12.353	25.180
17.00	16.775[b]	3.163	39.859	10.382	23.169
18.00	13.875[b]	2.985	32.417	7.797	19.953

a. Dependent Variable: SES_Impairment.

b. Covariates appearing in the model are evaluated at the following values: BrAC = .03543.

The Mean of Impairment Ratings for the Alcohol (Condition 0) and the AmED (Condition1) Conditions at Each Time-Point

Estimates[a]

Condition	Time	Mean	Std. Error	df	95% Confidence Interval	
					Lower Bound	Upper Bound
Condition 0	.00	5.513[b]	4.414	58.722	-3.320	14.347
	1.00	12.773[b]	4.279	49.489	4.176	21.371
	2.00	19.385[b]	4.543	50.086	10.260	28.511
	3.00	18.017[b]	3.618	48.795	10.746	25.287
	4.00	21.962[b]	3.903	50.292	14.123	29.800
	5.00	28.230[b]	3.909	49.601	20.376	36.084
	6.00	24.383[b]	3.792	50.907	16.771	31.995
	7.00	29.248[b]	4.445	47.804	20.309	38.186
	8.00	29.744[b]	4.288	48.988	21.128	38.361
	9.00	25.596[b]	4.002	52.518	17.567	33.624
	10.00	30.891[b]	4.044	54.418	22.785	38.997
	11.00	26.069[b]	3.836	45.937	18.348	33.789
	12.00	32.216[b]	4.222	52.734	23.748	40.685
	13.00	24.594[b]	3.451	48.343	17.656	31.531
	14.00	25.689[b]	3.649	43.166	18.331	33.046
	15.00	25.475[b]	4.197	49.915	17.044	33.906
	16.00	19.478[b]	3.720	46.075	11.989	26.966
	17.00	18.720[b]	3.762	48.859	11.160	26.280
	18.00	14.593[b]	3.312	40.309	7.900	21.286
Condition 1	.00	10.615[b]	3.547	57.869	3.515	17.716
	1.00	10.013[b]	3.595	45.857	2.777	17.249
	2.00	10.880[b]	3.393	41.325	4.029	17.731
	3.00	11.378[b]	3.154	38.361	4.995	17.761
	4.00	13.868[b]	3.137	37.191	7.513	20.223
	5.00	19.734[b]	3.271	42.330	13.135	26.333
	6.00	15.651[b]	2.987	32.464	9.571	21.732
	7.00	16.924[b]	3.223	40.465	10.412	23.436
	8.00	19.883[b]	3.163	39.013	13.486	26.281
	9.00	17.594[b]	3.265	41.897	11.006	24.183
	10.00	20.462[b]	3.511	45.733	13.394	27.529
	11.00	25.128[b]	4.085	51.073	16.926	33.329
	12.00	21.617[b]	3.303	41.149	14.946	28.288
	13.00	19.136[b]	3.260	41.913	12.556	25.716
	14.00	26.176[b]	3.740	48.646	18.658	33.694
	15.00	20.400[b]	3.099	35.518	14.111	26.688
	16.00	18.056[b]	3.274	40.467	11.441	24.670
	17.00	14.831[b]	3.191	39.908	8.381	21.281
	18.00	13.157[b]	2.992	32.629	7.066	19.248

a. Dependent Variable: SES_Impairment.

b. Covariates appearing in the model are evaluated at the following values: BrAC = .03543.

Pairwise Comparison for Impairment Rating between the Alcohol (Condition 0) and the AmED (Condition 1) Conditions at Each Time-Point

Pairwise Comparisons[a]

Time	(I) Condition	(J) Condition	Mean Difference (I-J)	Std. Error	df	Sig.[c]	95% Confidence Interval for Difference[c]	
							Lower Bound	Upper Bound
.00	Condition 0	Condition 1	-5.102	3.377	32.528	.141	-11.978	1.773
	Condition 1	Condition 0	5.102	3.377	32.528	.141	-1.773	11.978
1.00	Condition 0	Condition 1	2.761	3.846	40.375	.477	-5.010	10.531
	Condition 1	Condition 0	-2.761	3.846	40.375	.477	-10.531	5.010
2.00	Condition 0	Condition 1	8.505*	3.958	36.443	.038	.482	16.529
	Condition 1	Condition 0	-8.505*	3.958	36.443	.038	-16.529	-.482
3.00	Condition 0	Condition 1	6.639*	2.578	37.811	.014	1.419	11.859
	Condition 1	Condition 0	-6.639*	2.578	37.811	.014	-11.859	-1.419
4.00	Condition 0	Condition 1	8.094*	3.059	36.844	.012	1.894	14.294
	Condition 1	Condition 0	-8.094*	3.059	36.844	.012	-14.294	-1.894
5.00	Condition 0	Condition 1	8.496*	3.208	41.436	.011	2.018	14.973
	Condition 1	Condition 0	-8.496*	3.208	41.436	.011	-14.973	-2.018
6.00	Condition 0	Condition 1	8.732*	2.747	32.680	.003	3.141	14.323
	Condition 1	Condition 0	-8.732*	2.747	32.680	.003	-14.323	-3.141
7.00	Condition 0	Condition 1	12.324*	3.764	33.306	.002	4.669	19.978
	Condition 1	Condition 0	-12.324*	3.764	33.306	.002	-19.978	-4.669
8.00	Condition 0	Condition 1	9.861*	3.528	33.329	.009	2.685	17.037
	Condition 1	Condition 0	-9.861*	3.528	33.329	.009	-17.037	-2.685
9.00	Condition 0	Condition 1	8.001*	3.295	41.485	.020	1.349	14.654
	Condition 1	Condition 0	-8.001*	3.295	41.485	.020	-14.654	-1.349
10.00	Condition 0	Condition 1	10.430*	3.407	39.027	.004	3.538	17.321
	Condition 1	Condition 0	-10.430*	3.407	39.027	.004	-17.321	-3.538
11.00	Condition 0	Condition 1	.941	3.832	40.471	.807	-6.801	8.683
	Condition 1	Condition 0	-.941	3.832	40.471	.807	-8.683	6.801
12.00	Condition 0	Condition 1	10.599*	3.533	37.616	.005	3.443	17.754
	Condition 1	Condition 0	-10.599*	3.533	37.616	.005	-17.754	-3.443
13.00	Condition 0	Condition 1	5.458*	2.564	48.206	.038	.304	10.612
	Condition 1	Condition 0	-5.458*	2.564	48.206	.038	-10.612	-.304
14.00	Condition 0	Condition 1	-.487	3.391	40.017	.886	-7.340	6.365
	Condition 1	Condition 0	.487	3.391	40.017	.886	-6.365	7.340
15.00	Condition 0	Condition 1	5.075	3.396	33.219	.145	-1.833	11.983
	Condition 1	Condition 0	-5.075	3.396	33.219	.145	-11.983	1.833
16.00	Condition 0	Condition 1	1.422	2.973	34.792	.635	-4.614	7.458
	Condition 1	Condition 0	-1.422	2.973	34.792	.635	-7.458	4.614
17.00	Condition 0	Condition 1	3.889	2.941	38.676	.194	-2.063	9.840
	Condition 1	Condition 0	-3.889	2.941	38.676	.194	-9.840	2.063
18.00	Condition 0	Condition 1	1.436	2.051	30.090	.489	-2.752	5.624
	Condition 1	Condition 0	-1.436	2.051	30.090	.489	-5.624	2.752

Based on estimated marginal means

*. The mean difference is significant at the .05 level.

a. Dependent Variable: SES_Impairment.

c. Adjustment for multiple comparisons: Least Significant Difference (equivalent to no adjustments).

The Mean of Impairment Ratings for Males and Females at Each Time-Point

Estimates[a]

Sex	Time	Mean	Std. Error	df	95% Confidence Interval	
					Lower Bound	Upper Bound
Male	.00	8.639[b]	4.856	53.254	-1.099	18.377
	1.00	16.359[b]	4.813	51.250	6.698	26.021
	2.00	19.964[b]	4.787	49.381	10.347	29.581
	3.00	17.470[b]	4.345	38.350	8.677	26.263
	4.00	22.315[b]	4.425	40.382	13.374	31.256
	5.00	28.378[b]	4.509	43.259	19.287	37.470
	6.00	21.770[b]	4.361	38.930	12.949	30.591
	7.00	23.976[b]	4.663	45.930	14.590	33.362
	8.00	23.852[b]	4.577	44.173	14.630	33.075
	9.00	21.962[b]	4.523	43.870	12.846	31.078
	10.00	23.958[b]	4.520	43.256	14.845	33.071
	11.00	26.585[b]	4.691	47.887	17.152	36.017
	12.00	24.938[b]	4.595	45.307	15.684	34.191
	13.00	18.711[b]	4.284	37.273	10.032	27.390
	14.00	21.577[b]	4.545	44.159	12.418	30.736
	15.00	16.576[b]	4.528	43.035	7.445	25.708
	16.00	15.782[b]	4.428	40.971	6.838	24.726
	17.00	14.745[b]	4.414	40.710	5.828	23.662
	18.00	11.842[b]	4.174	33.385	3.354	20.330
Female	.00	7.490[b]	4.919	49.877	-2.392	17.371
	1.00	6.427[b]	4.885	46.784	-3.401	16.255
	2.00	10.301[b]	4.997	49.897	.265	20.338
	3.00	11.924[b]	4.469	36.914	2.869	20.980
	4.00	13.514[b]	4.627	41.564	4.173	22.855
	5.00	19.586[b]	4.643	42.006	10.215	28.956
	6.00	18.265[b]	4.506	38.282	9.145	27.385
	7.00	22.196[b]	4.960	50.408	12.235	32.156
	8.00	25.775[b]	4.873	48.692	15.982	35.569
	9.00	21.229[b]	4.754	46.017	11.660	30.798
	10.00	27.395[b]	4.957	53.510	17.454	37.335
	11.00	24.611[b]	5.093	56.467	14.411	34.812
	12.00	28.896[b]	4.919	51.233	19.021	38.771
	13.00	25.019[b]	4.548	40.659	15.832	34.205
	14.00	30.288[b]	4.794	46.771	20.643	39.933
	15.00	29.298[b]	4.800	46.243	19.637	38.959
	16.00	21.751[b]	4.614	41.539	12.437	31.065
	17.00	18.806[b]	4.601	41.415	9.516	28.096
	18.00	15.908[b]	4.323	33.072	7.113	24.703

a. Dependent Variable: SES_Impairment.

b. Covariates appearing in the model are evaluated at the following values: BrAC = .03543.

Pairwise Comparison for Impairment Ratings between Males and Females at Each Time-Point

Pairwise Comparisons[a]

Time	(I) Sex	(J) Sex	Mean Difference (I-J)	Std. Error	df	Sig.[b]	95% Confidence Interval for Difference[b]	
							Lower Bound	Upper Bound
.00	Male	Female	1.149	6.544	41.903	.861	-12.059	14.357
	Female	Male	-1.149	6.544	41.903	.861	-14.357	12.059
1.00	Male	Female	9.932	6.810	47.679	.151	-3.763	23.627
	Female	Male	-9.932	6.810	47.679	.151	-23.627	3.763
2.00	Male	Female	9.663	6.864	48.256	.166	-4.136	23.461
	Female	Male	-9.663	6.864	48.256	.166	-23.461	4.136
3.00	Male	Female	5.546	6.186	36.557	.376	-6.995	18.086
	Female	Male	-5.546	6.186	36.557	.376	-18.086	6.995
4.00	Male	Female	8.801	6.418	41.430	.178	-4.157	21.759
	Female	Male	-8.801	6.418	41.430	.178	-21.759	4.157
5.00	Male	Female	8.793	6.490	43.044	.183	-4.295	21.880
	Female	Male	-8.793	6.490	43.044	.183	-21.880	4.295
6.00	Male	Female	3.505	6.293	39.134	.581	-9.222	16.232
	Female	Male	-3.505	6.293	39.134	.581	-16.232	9.222
7.00	Male	Female	1.781	6.823	48.744	.795	-11.932	15.494
	Female	Male	-1.781	6.823	48.744	.795	-15.494	11.932
8.00	Male	Female	-1.923	6.712	47.296	.776	-15.423	11.577
	Female	Male	1.923	6.712	47.296	.776	-11.577	15.423
9.00	Male	Female	.733	6.605	46.201	.912	-12.561	14.027
	Female	Male	-.733	6.605	46.201	.912	-14.027	12.561
10.00	Male	Female	-3.436	6.653	46.977	.608	-16.820	9.947
	Female	Male	3.436	6.653	46.977	.608	-9.947	16.820
11.00	Male	Female	1.973	6.911	51.944	.776	-11.896	15.842
	Female	Male	-1.973	6.911	51.944	.776	-15.842	11.896
12.00	Male	Female	-3.958	6.756	49.095	.561	-17.534	9.618
	Female	Male	3.958	6.756	49.095	.561	-9.618	17.534
13.00	Male	Female	-6.308	6.291	40.059	.322	-19.021	6.405
	Female	Male	6.308	6.291	40.059	.322	-6.405	19.021
14.00	Male	Female	-8.711	6.646	46.550	.196	-22.084	4.662
	Female	Male	8.711	6.646	46.550	.196	-4.662	22.084
15.00	Male	Female	-12.722	6.647	46.061	.062	-26.102	.658
	Female	Male	12.722	6.647	46.061	.062	-.658	26.102
16.00	Male	Female	-5.969	6.443	42.420	.359	-18.968	7.029
	Female	Male	5.969	6.443	42.420	.359	-7.029	18.968
17.00	Male	Female	-4.061	6.426	42.338	.531	-17.027	8.905
	Female	Male	4.061	6.426	42.338	.531	-8.905	17.027
18.00	Male	Female	-4.066	6.048	34.037	.506	-16.356	8.225
	Female	Male	4.066	6.048	34.037	.506	-8.225	16.356

Based on estimated marginal means

a. Dependent Variable: SES_Impairment.

b. Adjustment for multiple comparisons: Least Significant Difference (equivalent to no adjustments).

F-Statistics for Mental Fatigued Rating

Type III Tests of Fixed Effects[a]

Source	Numerator df	Denominator df	F	Sig.
Intercept	1	102.074	51.819	.000
Sex	1	32.192	.139	.711
Session	1	569.669	7.963	.005
Condition	1	635.204	64.432	.000
Time	18	73.794	7.374	.000
Condition * Time	18	70.761	2.017	.020
Condition * Sex	1	576.527	6.313	.012
Time * Sex	18	74.200	.720	.780
Condition * Time * Sex	18	69.223	.684	.815
BrAC	1	485.233	.060	.807

a. Dependent Variable: SES_MentalFatigue.

The Mean of Mental Fatigued Rating for the Alcohol (Condition 0) and the AmED (Condition 1) Conditions

1. Condition[a]

Condition	Mean	Std. Error	df	95% Confidence Interval	
				Lower Bound	Upper Bound
Condition 0	20.151[b]	1.674	33.511	16.747	23.555
Condition 1	12.941[b]	1.613	28.686	9.640	16.242

a. Dependent Variable: SES_MentalFatigue.

b. Covariates appearing in the model are evaluated at the following values: BrAC = .03543.

The Mean of Mental Fatigued Rating for the Alcohol (Condition 0) and the AmED (Condition 1) Conditions

2. Time[a]

Time	Mean	Std. Error	df	95% Confidence Interval	
				Lower Bound	Upper Bound
.00	10.098[b]	3.076	124.060	4.010	16.186
1.00	5.515[b]	2.185	60.687	1.145	9.885
2.00	11.047[b]	2.531	76.186	6.007	16.088
3.00	8.143[b]	2.110	59.610	3.922	12.364
4.00	9.774[b]	2.004	48.943	5.748	13.801
5.00	13.630[b]	2.098	54.470	9.424	17.835
6.00	14.148[b]	2.241	60.327	9.666	18.630
7.00	15.050[b]	2.275	59.597	10.498	19.602
8.00	18.013[b]	2.313	63.303	13.391	22.635
9.00	16.650[b]	2.209	55.621	12.225	21.076
10.00	20.480[b]	2.493	74.878	15.513	25.447
11.00	18.960[b]	2.355	70.911	14.265	23.655
12.00	19.026[b]	2.281	66.826	14.472	23.580
13.00	25.270[b]	2.746	75.982	19.801	30.739
14.00	28.164[b]	2.822	58.888	22.518	33.811
15.00	24.015[b]	2.765	64.025	18.492	29.538
16.00	20.107[b]	2.494	60.533	15.119	25.095
17.00	18.400[b]	2.554	57.089	13.285	23.514
18.00	17.880[b]	2.510	62.639	12.863	22.898

a. Dependent Variable: SES_MentalFatigue.

b. Covariates appearing in the model are evaluated at the following values: BrAC = .03543.

The Mean of Mental Fatigued Rating for the Alcohol (Condition 0) and the AmED (Condition 1) Conditions at Each Time-Point

Estimates[a]

Condition	Time	Mean	Std. Error	df	95% Confidence Interval	
					Lower Bound	Upper Bound
Condition 0	.00	9.610[b]	3.740	49.571	2.096	17.124
	1.00	5.612[b]	2.701	41.874	.162	11.062
	2.00	10.633[b]	3.457	38.990	3.641	17.624
	3.00	8.847[b]	2.581	43.732	3.644	14.049
	4.00	13.209[b]	2.663	39.198	7.824	18.594
	5.00	17.186[b]	2.967	39.603	11.187	23.184
	6.00	17.017[b]	3.288	38.078	10.361	23.672
	7.00	20.002[b]	3.379	36.463	13.153	26.852
	8.00	24.130[b]	3.472	38.867	17.107	31.153
	9.00	23.268[b]	3.363	37.162	16.455	30.081
	10.00	26.979[b]	3.708	40.352	19.488	34.470
	11.00	22.814[b]	3.303	38.962	16.132	29.495
	12.00	25.105[b]	3.252	41.277	18.538	31.672
	13.00	32.221[b]	3.689	36.667	24.744	39.697
	14.00	33.059[b]	4.155	27.586	24.542	41.577
	15.00	29.760[b]	4.094	30.720	21.408	38.112
	16.00	23.576[b]	3.500	27.814	16.405	30.747
	17.00	20.809[b]	3.483	23.373	13.611	28.008
	18.00	19.031[b]	2.739	28.101	13.421	24.641
Condition 1	.00	10.587[b]	3.577	55.320	3.420	17.754
	1.00	5.418[b]	2.505	47.228	.380	10.456
	2.00	11.462[b]	2.852	43.695	5.713	17.211
	3.00	7.439[b]	2.390	45.799	2.627	12.251
	4.00	6.340[b]	2.107	35.875	2.067	10.613
	5.00	10.074[b]	2.052	34.208	5.904	14.244
	6.00	11.279[b]	2.150	42.476	6.942	15.617
	7.00	10.098[b]	2.093	41.417	5.872	14.324
	8.00	11.897[b]	2.112	41.170	7.633	16.160
	9.00	10.033[b]	1.858	33.553	6.254	13.812
	10.00	13.981[b]	2.202	49.051	9.557	18.405
	11.00	15.107[b]	2.317	40.150	10.424	19.789
	12.00	12.947[b]	2.210	39.535	8.478	17.416
	13.00	18.319[b]	3.411	34.711	11.393	25.245
	14.00	23.269[b]	3.142	27.466	16.828	29.711
	15.00	18.269[b]	3.038	32.035	12.082	24.457
	16.00	16.638[b]	2.830	32.949	10.880	22.395
	17.00	15.990[b]	3.057	31.772	9.760	22.219
	18.00	16.730[b]	3.616	33.022	9.372	24.087

a. Dependent Variable: SES_MentalFatigue.

b. Covariates appearing in the model are evaluated at the following values: BrAC = .03543.

Pairwise Comparison for Mental Fatigue Rating between the Alcohol (Condition 0) and the AmED (Condition 1) Conditions at Each Time-Point

Pairwise Comparisons[a]

Time	(I) Condition	(J) Condition	Mean Difference (I-J)	Std. Error	df	Sig.[c]	95% Confidence Interval for Difference[c]	
							Lower Bound	Upper Bound
.00	Condition 0	Condition 1	-.977	3.965	38.390	.807	-9.001	7.046
	Condition 1	Condition 0	.977	3.965	38.390	.807	-7.046	9.001
1.00	Condition 0	Condition 1	.194	2.834	39.644	.946	-5.535	5.924
	Condition 1	Condition 0	-.194	2.834	39.644	.946	-5.924	5.535
2.00	Condition 0	Condition 1	-.830	3.814	45.304	.829	-8.510	6.850
	Condition 1	Condition 0	.830	3.814	45.304	.829	-6.850	8.510
3.00	Condition 0	Condition 1	1.408	2.635	42.562	.596	-3.907	6.723
	Condition 1	Condition 0	-1.408	2.635	42.562	.596	-6.723	3.907
4.00	Condition 0	Condition 1	6.869*	2.645	39.194	.013	1.520	12.219
	Condition 1	Condition 0	-6.869*	2.645	39.194	.013	-12.219	-1.520
5.00	Condition 0	Condition 1	7.112*	2.902	38.130	.019	1.237	12.986
	Condition 1	Condition 0	-7.112*	2.902	38.130	.019	-12.986	-1.237
6.00	Condition 0	Condition 1	5.737	3.283	38.049	.089	-.909	12.383
	Condition 1	Condition 0	-5.737	3.283	38.049	.089	-12.383	.909
7.00	Condition 0	Condition 1	9.905*	3.300	34.093	.005	3.199	16.610
	Condition 1	Condition 0	-9.905*	3.300	34.093	.005	-16.610	-3.199
8.00	Condition 0	Condition 1	12.233*	3.409	35.933	.001	5.320	19.147
	Condition 1	Condition 0	-12.233*	3.409	35.933	.001	-19.147	-5.320
9.00	Condition 0	Condition 1	13.235*	3.164	30.581	.000	6.778	19.691
	Condition 1	Condition 0	-13.235*	3.164	30.581	.000	-19.691	-6.778
10.00	Condition 0	Condition 1	12.998*	3.510	31.551	.001	5.845	20.151
	Condition 1	Condition 0	-12.998*	3.510	31.551	.001	-20.151	-5.845
11.00	Condition 0	Condition 1	7.707*	3.223	33.736	.023	1.156	14.258
	Condition 1	Condition 0	-7.707*	3.223	33.736	.023	-14.258	-1.156
12.00	Condition 0	Condition 1	12.158*	3.180	36.377	.000	5.711	18.604
	Condition 1	Condition 0	-12.158*	3.180	36.377	.000	-18.604	-5.711
13.00	Condition 0	Condition 1	13.902*	4.508	47.942	.003	4.838	22.965
	Condition 1	Condition 0	-13.902*	4.508	47.942	.003	-22.965	-4.838
14.00	Condition 0	Condition 1	9.790*	4.736	35.669	.046	.182	19.397
	Condition 1	Condition 0	-9.790*	4.736	35.669	.046	-19.397	-.182
15.00	Condition 0	Condition 1	11.491*	4.626	39.512	.017	2.138	20.844
	Condition 1	Condition 0	-11.491*	4.626	39.512	.017	-20.844	-2.138
16.00	Condition 0	Condition 1	6.938	3.953	34.623	.088	-1.089	14.966
	Condition 1	Condition 0	-6.938	3.953	34.623	.088	-14.966	1.089
17.00	Condition 0	Condition 1	4.820	4.107	32.458	.249	-3.541	13.180
	Condition 1	Condition 0	-4.820	4.107	32.458	.249	-13.180	3.541
18.00	Condition 0	Condition 1	2.301	3.994	36.788	.568	-5.794	10.395
	Condition 1	Condition 0	-2.301	3.994	36.788	.568	-10.395	5.794

Based on estimated marginal means

*. The mean difference is significant at the .05 level.

a. Dependent Variable: SES_MentalFatigue.

c. Adjustment for multiple comparisons: Least Significant Difference (equivalent to no adjustments).

The Mean of Mental Fatigue Rating for the Males and Females in the Alcohol (Condition 0) and the AmED (Condition 1) Conditions

Estimates[a]

Condition	Sex	Mean	Std. Error	df	95% Confidence Interval	
					Lower Bound	Upper Bound
Condition 0	Male	19.707[b]	2.346	34.703	14.943	24.471
	Female	20.595[b]	2.509	38.759	15.520	25.670
Condition 1	Male	14.626[b]	2.317	32.594	9.911	19.342
	Female	11.256[b]	2.331	29.132	6.488	16.023

a. Dependent Variable: SES_MentalFatigue.

b. Covariates appearing in the model are evaluated at the following values: BrAC = .03543.

Pairwise Comparison for Mental Fatigue Rating between the Alcohol (Condition 0) and the AmED (Condition 1) Conditions for Males and Females

Pairwise Comparisons[a]

Sex	(I) Condition	(J) Condition	Mean Difference (I-J)	Std. Error	df	Sig.[c]	95% Confidence Interval for Difference[c]	
							Lower Bound	Upper Bound
Male	Condition 0	Condition 1	5.081*	1.185	583.979	.000	2.753	7.409
	Condition 1	Condition 0	-5.081*	1.185	583.979	.000	-7.409	-2.753
Female	Condition 0	Condition 1	9.339*	1.282	630.125	.000	6.821	11.857
	Condition 1	Condition 0	-9.339*	1.282	630.125	.000	-11.857	-6.821

Based on estimated marginal means

*. The mean difference is significant at the .05 level.

a. Dependent Variable: SES_MentalFatigue.

c. Adjustment for multiple comparisons: Least Significant Difference (equivalent to no adjustments).

F-statistics for Legally Able to Drive Rating

Type III Tests of Fixed Effects[a]

Source	Numerator df	Denominator df	F	Sig.
Intercept	1	41.851	93.733	.000
Sex	1	28.037	2.133	.155
Session	1	676.339	8.508	.004
Condition	1	703.662	57.724	.000
Time	18	53.759	4.940	.000
Condition * Time	18	45.442	1.588	.105
Condition * Sex	1	655.411	1.873	.172
Time * Sex	18	46.094	3.126	.001
Condition * Time * Sex	18	47.469	.279	.998
BrAC	1	356.756	6.474	.011

a. Dependent Variable: SES_Drive.

The Mean of Legally Able to Drive Rating for the Alcohol (Condition 0) and the AmED (Condition 1) Conditions

1. Condition[a]

Condition	Mean	Std. Error	df	95% Confidence Interval	
				Lower Bound	Upper Bound
Condition 0	47.535[b]	5.694	28.692	35.883	59.187
Condition 1	59.691[b]	5.640	27.610	48.131	71.251

a. Dependent Variable: SES_Drive.

b. Covariates appearing in the model are evaluated at the following values: BrAC = .03543.

The Mean of Legally Able to Drive Rating at Each Time-Point

2. Time[a]

Time	Mean	Std. Error	df	95% Confidence Interval	
				Lower Bound	Upper Bound
.00	86.442[b]	7.442	68.155	71.591	101.292
1.00	64.927[b]	6.921	53.843	51.050	78.805
2.00	62.803[b]	6.683	48.889	49.373	76.233
3.00	64.182[b]	6.524	45.892	51.048	77.316
4.00	53.449[b]	6.286	40.322	40.748	66.151
5.00	49.858[b]	6.290	40.347	37.148	62.568
6.00	50.293[b]	6.119	36.655	37.891	62.696
7.00	45.960[b]	6.290	39.670	33.245	58.676
8.00	44.220[b]	6.198	37.910	31.673	56.768
9.00	45.265[b]	6.100	36.544	32.901	57.629
10.00	42.239[b]	6.350	42.655	29.429	55.049
11.00	41.170[b]	6.222	39.400	28.590	53.750
12.00	43.545[b]	6.199	38.876	31.004	56.085
13.00	50.629[b]	5.977	34.175	38.485	62.773
14.00	49.911[b]	5.992	34.370	37.738	62.084
15.00	52.740[b]	6.136	37.301	40.311	65.170
16.00	54.711[b]	6.105	36.663	42.336	67.085
17.00	57.247[b]	6.033	35.328	45.004	69.491
18.00	59.055[b]	6.059	35.719	46.763	71.346

a. Dependent Variable: SES_Drive.

b. Covariates appearing in the model are evaluated at the following values: BrAC = .03543.

The Mean of Legally Able to Drive Rating for the Alcohol (Condition 0) and the AmED (Condition 1) Conditions at Each Time-Point

Estimates[a]

Condition	Time	Mean	Std. Error	df	95% Confidence Interval	
					Lower Bound	Upper Bound
Condition 0	.00	90.058[b]	8.250	57.761	73.542	106.573
	1.00	59.613[b]	8.161	48.435	43.208	76.018
	2.00	56.063[b]	7.848	47.600	40.280	71.846
	3.00	58.041[b]	7.517	46.983	42.919	73.162
	4.00	45.799[b]	7.296	45.298	31.108	60.491
	5.00	41.221[b]	7.503	46.902	26.126	56.316
	6.00	41.984[b]	7.275	44.378	27.327	56.641
	7.00	36.424[b]	7.825	46.784	20.679	52.169
	8.00	34.611[b]	7.602	46.011	19.309	49.913
	9.00	35.131[b]	7.268	48.483	20.522	49.740
	10.00	34.049[b]	7.123	50.411	19.745	48.352
	11.00	32.160[b]	7.183	47.734	17.716	46.604
	12.00	35.255[b]	7.246	48.593	20.690	49.820
	13.00	43.627[b]	6.871	45.906	29.795	57.459
	14.00	45.132[b]	6.908	44.482	31.214	59.049
	15.00	47.292[b]	7.188	46.689	32.830	61.755
	16.00	51.929[b]	7.326	48.852	37.205	66.652
	17.00	55.943[b]	7.117	49.559	41.645	70.240
	18.00	58.833[b]	7.138	48.226	44.484	73.183
Condition 1	.00	82.825[b]	8.811	55.944	65.174	100.477
	1.00	70.242[b]	7.834	52.188	54.523	85.960
	2.00	69.543[b]	7.283	48.575	54.904	84.183
	3.00	70.323[b]	7.071	49.157	56.116	84.531
	4.00	61.099[b]	6.561	42.048	47.859	74.339
	5.00	58.495[b]	6.347	40.417	45.671	71.318
	6.00	58.603[b]	5.910	32.841	46.576	70.630
	7.00	55.496[b]	5.875	32.049	43.531	67.461
	8.00	53.830[b]	5.808	30.851	41.981	65.678
	9.00	55.399[b]	5.834	31.318	43.506	67.292
	10.00	50.429[b]	6.715	45.204	36.906	63.952
	11.00	50.179[b]	6.199	37.829	37.629	62.730
	12.00	51.835[b]	6.146	36.677	39.378	64.292
	13.00	57.631[b]	5.763	29.907	45.859	69.402
	14.00	54.690[b]	5.826	31.032	42.808	66.572
	15.00	58.188[b]	6.105	35.724	45.803	70.574
	16.00	57.493[b]	5.812	30.969	45.640	69.346
	17.00	58.552[b]	5.789	30.540	46.737	70.367
	18.00	59.276[b]	5.856	31.730	47.344	71.207

a. Dependent Variable: SES_Drive.

b. Covariates appearing in the model are evaluated at the following values: BrAC = .03543.

Pairwise Comparison for Legally Able to Drive Rating between the Alcohol (Condition 0) and the AmED (Condition 1) Conditions at Each Time-Point

Pairwise Comparisons[a]

Time	(I) Condition	(J) Condition	Mean Difference (I-J)	Std. Error	df	Sig.[c]	95% Confidence Interval for Difference[c]	
							Lower Bound	Upper Bound
.00	Condition 0	Condition 1	7.233	8.357	44.696	.391	-9.602	24.067
	Condition 1	Condition 0	-7.233	8.357	44.696	.391	-24.067	9.602
1.00	Condition 0	Condition 1	-10.629	8.020	46.396	.192	-26.769	5.511
	Condition 1	Condition 0	10.629	8.020	46.396	.192	-5.511	26.769
2.00	Condition 0	Condition 1	-13.480	7.117	38.753	.066	-27.878	.918
	Condition 1	Condition 0	13.480	7.117	38.753	.066	-.918	27.878
3.00	Condition 0	Condition 1	-12.283	6.536	39.812	.068	-25.493	.928
	Condition 1	Condition 0	12.283	6.536	39.812	.068	-.928	25.493
4.00	Condition 0	Condition 1	-15.300*	5.872	36.061	.013	-27.209	-3.391
	Condition 1	Condition 0	15.300*	5.872	36.061	.013	3.391	27.209
5.00	Condition 0	Condition 1	-17.273*	5.906	36.308	.006	-29.248	-5.299
	Condition 1	Condition 0	17.273*	5.906	36.308	.006	5.299	29.248
6.00	Condition 0	Condition 1	-16.619*	5.093	24.559	.003	-27.118	-6.121
	Condition 1	Condition 0	16.619*	5.093	24.559	.003	6.121	27.118
7.00	Condition 0	Condition 1	-19.072*	5.766	25.323	.003	-30.939	-7.205
	Condition 1	Condition 0	19.072*	5.766	25.323	.003	7.205	30.939
8.00	Condition 0	Condition 1	-19.219*	5.423	24.003	.002	-30.411	-8.026
	Condition 1	Condition 0	19.219*	5.423	24.003	.002	8.026	30.411
9.00	Condition 0	Condition 1	-20.268*	4.988	28.447	.000	-30.478	-10.059
	Condition 1	Condition 0	20.268*	4.988	28.447	.000	10.059	30.478
10.00	Condition 0	Condition 1	-16.380*	5.508	41.171	.005	-27.503	-5.258
	Condition 1	Condition 0	16.380*	5.508	41.171	.005	5.258	27.503
11.00	Condition 0	Condition 1	-18.019*	5.020	29.916	.001	-28.273	-7.766
	Condition 1	Condition 0	18.019*	5.020	29.916	.001	7.766	28.273
12.00	Condition 0	Condition 1	-16.580*	5.181	31.786	.003	-27.136	-6.024
	Condition 1	Condition 0	16.580*	5.181	31.786	.003	6.024	27.136
13.00	Condition 0	Condition 1	-14.004*	4.238	26.258	.003	-22.710	-5.298
	Condition 1	Condition 0	14.004*	4.238	26.258	.003	5.298	22.710
14.00	Condition 0	Condition 1	-9.559*	4.437	25.269	.041	-18.693	-.424
	Condition 1	Condition 0	9.559*	4.437	25.269	.041	.424	18.693
15.00	Condition 0	Condition 1	-10.896*	5.222	32.264	.045	-21.530	-.262
	Condition 1	Condition 0	10.896*	5.222	32.264	.045	.262	21.530
16.00	Condition 0	Condition 1	-5.564	5.078	28.606	.282	-15.956	4.827
	Condition 1	Condition 0	5.564	5.078	28.606	.282	-4.827	15.956
17.00	Condition 0	Condition 1	-2.610	4.768	32.859	.588	-12.311	7.092
	Condition 1	Condition 0	2.610	4.768	32.859	.588	-7.092	12.311
18.00	Condition 0	Condition 1	-.442	4.861	31.532	.928	-10.349	9.465
	Condition 1	Condition 0	.442	4.861	31.532	.928	-9.465	10.349

Based on estimated marginal means

*. The mean difference is significant at the .05 level.

a. Dependent Variable: SES_Drive.

c. Adjustment for multiple comparisons: Least Significant Difference (equivalent to no adjustments).

The Mean of Legally Able to Drive Rating for Males and Females at Each Time-Point

Estimates[a]

Sex	Time	Mean	Std. Error	df	95% Confidence Interval	
					Lower Bound	Upper Bound
Male	.00	83.478[b]	10.082	61.862	63.323	103.632
	1.00	68.405[b]	9.562	52.846	49.224	87.585
	2.00	65.185[b]	9.123	46.046	46.822	83.549
	3.00	66.707[b]	8.991	44.635	48.595	84.820
	4.00	57.431[b]	8.670	39.435	39.900	74.961
	5.00	52.941[b]	8.727	40.331	35.308	70.574
	6.00	60.151[b]	8.488	36.665	42.947	77.355
	7.00	53.839[b]	8.639	38.099	36.352	71.326
	8.00	52.317[b]	8.534	36.796	35.023	69.611
	9.00	52.465[b]	8.442	36.123	35.345	69.585
	10.00	49.034[b]	8.576	38.331	31.677	66.392
	11.00	49.026[b]	8.421	35.753	31.944	66.109
	12.00	52.927[b]	8.477	36.699	35.745	70.109
	13.00	66.179[b]	8.232	33.169	49.434	82.923
	14.00	65.884[b]	8.281	33.830	49.051	82.717
	15.00	66.978[b]	8.479	36.771	49.793	84.163
	16.00	68.655[b]	8.506	37.212	51.423	85.887
	17.00	70.991[b]	8.433	36.304	53.894	88.088
	18.00	73.147[b]	8.466	36.660	55.987	90.307
Female	.00	89.405[b]	10.286	58.590	68.819	109.991
	1.00	61.450[b]	9.917	52.686	41.557	81.344
	2.00	60.421[b]	9.656	49.198	41.019	79.823
	3.00	61.657[b]	9.361	45.161	42.804	80.509
	4.00	49.468[b]	9.139	41.741	31.021	67.914
	5.00	46.775[b]	9.114	41.238	28.372	65.178
	6.00	40.436[b]	8.840	36.936	22.522	58.349
	7.00	38.081[b]	9.175	41.589	19.559	56.603
	8.00	36.124[b]	9.039	39.688	17.852	54.396
	9.00	38.065[b]	8.909	38.587	20.039	56.091
	10.00	35.444[b]	9.268	44.907	16.777	54.110
	11.00	33.313[b]	9.120	42.126	14.910	51.717
	12.00	34.163[b]	9.100	41.832	15.796	52.529
	13.00	35.079[b]	8.742	36.251	17.354	52.804
	14.00	33.938[b]	8.739	36.035	16.215	51.660
	15.00	38.503[b]	8.977	39.475	20.353	56.653
	16.00	40.767[b]	8.867	37.847	22.814	58.720
	17.00	43.504[b]	8.733	36.022	25.793	61.214
	18.00	44.962[b]	8.754	36.147	27.211	62.712

a. Dependent Variable: SES_Drive.

b. Covariates appearing in the model are evaluated at the following values: BrAC = .03543.

Pairwise Comparison for Legally Able to Drive Rating between Males and Females at Each Time-Point

Pairwise Comparisons[a]

Time	(I) Sex	(J) Sex	Mean Difference (I-J)	Std. Error	df	Sig.[c]	95% Confidence Interval for Difference[c]	
							Lower Bound	Upper Bound
.00	Male	Female	-5.928	13.905	52.925	.672	-33.818	21.963
	Female	Male	5.928	13.905	52.925	.672	-21.963	33.818
1.00	Male	Female	6.954	13.709	51.906	.614	-20.556	34.465
	Female	Male	-6.954	13.709	51.906	.614	-34.465	20.556
2.00	Male	Female	4.764	13.203	46.611	.720	-21.802	31.330
	Female	Male	-4.764	13.203	46.611	.720	-31.330	21.802
3.00	Male	Female	5.050	12.910	44.026	.698	-20.967	31.068
	Female	Male	-5.050	12.910	44.026	.698	-31.068	20.967
4.00	Male	Female	7.963	12.622	40.957	.532	-17.529	33.455
	Female	Male	-7.963	12.622	40.957	.532	-33.455	17.529
5.00	Male	Female	6.166	12.656	41.293	.629	-19.387	31.719
	Female	Male	-6.166	12.656	41.293	.629	-31.719	19.387
6.00	Male	Female	19.715	12.274	36.970	.117	-5.154	44.585
	Female	Male	-19.715	12.274	36.970	.117	-44.585	5.154
7.00	Male	Female	15.758	12.625	40.154	.219	-9.754	41.270
	Female	Male	-15.758	12.625	40.154	.219	-41.270	9.754
8.00	Male	Female	16.193	12.466	38.684	.202	-9.028	41.414
	Female	Male	-16.193	12.466	38.684	.202	-41.414	9.028
9.00	Male	Female	14.400	12.348	38.271	.251	-10.591	39.390
	Female	Male	-14.400	12.348	38.271	.251	-39.390	10.591
10.00	Male	Female	13.591	12.553	40.754	.285	-11.765	38.947
	Female	Male	-13.591	12.553	40.754	.285	-38.947	11.765
11.00	Male	Female	15.713	12.383	38.625	.212	-9.343	40.768
	Female	Male	-15.713	12.383	38.625	.212	-40.768	9.343
12.00	Male	Female	18.764	12.475	39.795	.140	-6.452	43.981
	Female	Male	-18.764	12.475	39.795	.140	-43.981	6.452
13.00	Male	Female	31.100*	12.061	35.338	.014	6.623	55.577
	Female	Male	-31.100*	12.061	35.338	.014	-55.577	-6.623
14.00	Male	Female	31.947*	12.094	35.573	.012	7.408	56.485
	Female	Male	-31.947*	12.094	35.573	.012	-56.485	-7.408
15.00	Male	Female	28.475*	12.424	39.080	.027	3.347	53.604
	Female	Male	-28.475*	12.424	39.080	.027	-53.604	-3.347
16.00	Male	Female	27.888*	12.364	38.450	.030	2.869	52.908
	Female	Male	-27.888*	12.364	38.450	.030	-52.908	-2.869
17.00	Male	Female	27.488*	12.213	37.018	.030	2.743	52.232
	Female	Male	-27.488*	12.213	37.018	.030	-52.232	-2.743
18.00	Male	Female	28.186*	12.238	37.103	.027	3.391	52.980
	Female	Male	-28.186*	12.238	37.103	.027	-52.980	-3.391

Based on estimated marginal means

*. The mean difference is significant at the .05 level.

a. Dependent Variable: SES_Drive.

c. Adjustment for multiple comparisons: Least Significant Difference (equivalent to no adjustments).

F-Statistics for SES: Stimulation Rating

Type III Tests of Fixed Effects[a]

Source	Numerator df	Denominator df	F	Sig.
Intercept	1	45.395	66.474	.000
Sex	1	28.396	2.944	.097
Session	1	654.597	64.611	.000
Condition	1	680.808	10.063	.002
Time	18	69.864	3.045	.000
Condition * Time	18	68.224	.870	.614
Condition * Sex	1	604.682	7.265	.007
Time * Sex	18	73.996	2.024	.018
Condition * Time * Sex	18	67.369	.636	.858
BrAC	1	577.405	.364	.547

a. Dependent Variable: SES_Stimulation.

The Mean of Stimulation Rating for the Alcohol (Condition 0) and the AmED (Condition 1) Conditions

1. Condition[a]

Condition	Mean	Std. Error	df	95% Confidence Interval	
				Lower Bound	Upper Bound
Condition 0	36.003[b]	4.247	27.844	27.302	44.705
Condition 1	39.735[b]	4.267	28.385	31.000	48.470

a. Dependent Variable: SES_Stimulation.

b. Covariates appearing in the model are evaluated at the following values: BrAC = .03543.

The Mean of Stimulation Rating at Each Time-Point

2. Time[a]

Time	Mean	Std. Error	df	95% Confidence Interval	
				Lower Bound	Upper Bound
.00	28.743[b]	6.186	83.952	16.442	41.045
1.00	37.737[b]	4.913	45.667	27.845	47.629
2.00	40.213[b]	4.859	44.642	30.424	50.003
3.00	40.305[b]	4.836	43.524	30.555	50.055
4.00	40.195[b]	4.748	41.143	30.608	49.782
5.00	39.922[b]	4.580	36.548	30.638	49.207
6.00	40.049[b]	4.948	45.041	30.083	50.014
7.00	41.002[b]	4.609	37.612	31.670	50.335
8.00	44.032[b]	4.587	37.326	34.741	53.324
9.00	39.567[b]	4.496	34.591	30.435	48.699
10.00	44.961[b]	4.687	40.554	35.491	54.430
11.00	40.308[b]	4.668	40.087	30.875	49.741
12.00	38.700[b]	4.646	38.962	29.303	48.097
13.00	36.418[b]	4.514	34.953	27.253	45.582
14.00	35.854[b]	4.732	40.846	26.297	45.410
15.00	36.120[b]	4.694	39.546	26.630	45.610
16.00	33.010[b]	4.729	41.050	23.460	42.561
17.00	31.849[b]	4.896	45.073	21.988	41.710
18.00	30.528[b]	4.853	44.273	20.750	40.307

a. Dependent Variable: SES_Stimulation.

b. Covariates appearing in the model are evaluated at the following values: BrAC = .03543.

The Mean of Stimulation Rating for the Alcohol (Condition 0) and the AmED (Condition 1) Conditions at Each Time-Point

Estimates[a]

Condition	Time	Mean	Std. Error	df	95% Confidence Interval	
					Lower Bound	Upper Bound
Condition 0	.00	29.294[b]	7.103	54.538	15.057	43.531
	1.00	35.773[b]	5.257	44.555	25.182	46.364
	2.00	40.143[b]	5.076	44.535	29.917	50.369
	3.00	36.362[b]	4.774	38.035	26.697	46.027
	4.00	36.624[b]	4.765	38.738	26.984	46.264
	5.00	39.363[b]	4.624	36.142	29.987	48.739
	6.00	34.962[b]	4.646	37.085	25.549	44.375
	7.00	39.775[b]	4.771	40.765	30.138	49.412
	8.00	41.806[b]	4.818	41.440	32.080	51.533
	9.00	40.107[b]	4.742	39.446	30.519	49.696
	10.00	45.028[b]	5.217	51.105	34.555	55.500
	11.00	40.436[b]	5.273	52.209	29.855	51.017
	12.00	38.819[b]	4.989	46.024	28.778	48.860
	13.00	36.181[b]	4.984	43.462	26.133	46.228
	14.00	34.131[b]	5.180	45.341	23.700	44.563
	15.00	33.464[b]	5.083	41.185	23.201	43.727
	16.00	30.531[b]	5.117	45.248	20.226	40.836
	17.00	25.274[b]	5.810	47.498	13.589	36.959
	18.00	25.991[b]	5.348	48.045	15.238	36.743
Condition 1	.00	28.193[b]	7.567	53.260	13.017	43.368
	1.00	39.701[b]	5.722	52.336	28.220	51.183
	2.00	40.284[b]	5.685	51.820	28.875	51.692
	3.00	44.247[b]	5.882	50.787	32.437	56.058
	4.00	43.767[b]	5.711	50.467	32.298	55.235
	5.00	40.482[b]	5.260	47.263	29.901	51.063
	6.00	45.136[b]	6.426	46.427	32.205	58.067
	7.00	42.230[b]	5.172	44.923	31.812	52.648
	8.00	46.258[b]	5.063	46.072	36.067	56.449
	9.00	39.026[b]	4.824	40.984	29.285	48.768
	10.00	44.894[b]	4.823	41.684	35.158	54.629
	11.00	40.180[b]	4.734	40.014	30.614	49.747
	12.00	38.581[b]	5.031	45.196	28.450	48.713
	13.00	36.655[b]	4.610	36.858	27.312	45.997
	14.00	37.576[b]	5.260	46.793	26.993	48.159
	15.00	38.776[b]	5.237	45.609	28.233	49.319
	16.00	35.489[b]	5.330	47.880	24.771	46.207
	17.00	38.424[b]	5.231	44.567	27.884	48.963
	18.00	35.066[b]	5.549	45.594	23.893	46.239

a. Dependent Variable: SES_Stimulation.

b. Covariates appearing in the model are evaluated at the following values: BrAC = .03543.

Pairwise Comparison for Stimulation Rating between the Alcohol (Condition 0) and the AmED (Condition 1) Conditions at Each Time-Point

Pairwise Comparisons[a]

Time	(I) Condition	(J) Condition	Mean Difference (I-J)	Std. Error	df	Sig.[c]	95% Confidence Interval for Difference[c]	
							Lower Bound	Upper Bound
.00	Condition 0	Condition 1	1.101	7.897	46.401	.890	-14.790	16.993
	Condition 1	Condition 0	-1.101	7.897	46.401	.890	-16.993	14.790
1.00	Condition 0	Condition 1	-3.928	4.920	42.047	.429	-13.856	6.000
	Condition 1	Condition 0	3.928	4.920	42.047	.429	-6.000	13.856
2.00	Condition 0	Condition 1	-.141	4.660	40.292	.976	-9.556	9.275
	Condition 1	Condition 0	.141	4.660	40.292	.976	-9.275	9.556
3.00	Condition 0	Condition 1	-7.885	4.608	32.288	.097	-17.268	1.498
	Condition 1	Condition 0	7.885	4.608	32.288	.097	-1.498	17.268
4.00	Condition 0	Condition 1	-7.142	4.525	37.952	.123	-16.303	2.018
	Condition 1	Condition 0	7.142	4.525	37.952	.123	-2.018	16.303
5.00	Condition 0	Condition 1	-1.119	3.766	38.862	.768	-8.738	6.500
	Condition 1	Condition 0	1.119	3.766	38.862	.768	-6.500	8.738
6.00	Condition 0	Condition 1	-10.174	5.274	30.521	.063	-20.938	.590
	Condition 1	Condition 0	10.174	5.274	30.521	.063	-.590	20.938
7.00	Condition 0	Condition 1	-2.455	3.751	37.732	.517	-10.050	5.140
	Condition 1	Condition 0	2.455	3.751	37.732	.517	-5.140	10.050
8.00	Condition 0	Condition 1	-4.451	3.678	42.002	.233	-11.873	2.971
	Condition 1	Condition 0	4.451	3.678	42.002	.233	-2.971	11.873
9.00	Condition 0	Condition 1	1.081	3.262	37.928	.742	-5.523	7.685
	Condition 1	Condition 0	-1.081	3.262	37.928	.742	-7.685	5.523
10.00	Condition 0	Condition 1	.134	3.614	38.088	.971	-7.181	7.450
	Condition 1	Condition 0	-.134	3.614	38.088	.971	-7.450	7.181
11.00	Condition 0	Condition 1	.256	3.644	39.589	.944	-7.112	7.624
	Condition 1	Condition 0	-.256	3.644	39.589	.944	-7.624	7.112
12.00	Condition 0	Condition 1	.238	3.750	43.177	.950	-7.324	7.799
	Condition 1	Condition 0	-.238	3.750	43.177	.950	-7.799	7.324
13.00	Condition 0	Condition 1	-.474	3.267	37.052	.885	-7.093	6.145
	Condition 1	Condition 0	.474	3.267	37.052	.885	-6.145	7.093
14.00	Condition 0	Condition 1	-3.445	4.412	44.023	.439	-12.336	5.446
	Condition 1	Condition 0	3.445	4.412	44.023	.439	-5.446	12.336
15.00	Condition 0	Condition 1	-5.312	4.288	36.562	.223	-14.004	3.379
	Condition 1	Condition 0	5.312	4.288	36.562	.223	-3.379	14.004
16.00	Condition 0	Condition 1	-4.958	4.442	44.249	.270	-13.909	3.994
	Condition 1	Condition 0	4.958	4.442	44.249	.270	-3.994	13.909
17.00	Condition 0	Condition 1	-13.149*	5.134	40.183	.014	-23.524	-2.775
	Condition 1	Condition 0	13.149*	5.134	40.183	.014	2.775	23.524
18.00	Condition 0	Condition 1	-9.075	4.960	43.187	.074	-19.077	.926
	Condition 1	Condition 0	9.075	4.960	43.187	.074	-.926	19.077

Based on estimated marginal means

*. The mean difference is significant at the .05 level.

a. Dependent Variable: SES_Stimulation.

c. Adjustment for multiple comparisons: Least Significant Difference (equivalent to no adjustments).

The Mean of Stimulation Rating for Males and Females in the Alcohol (Condition 0) and the AmED (Condition 1) Conditions

Estimates[a]

Condition	Sex	Mean	Std. Error	df	95% Confidence Interval	
					Lower Bound	Upper Bound
Condition 0	Male	30.159[b]	5.904	28.036	18.065	42.253
	Female	41.848[b]	6.180	29.000	29.208	54.487
Condition 1	Male	30.931[b]	5.974	29.381	18.721	43.142
	Female	48.539[b]	6.150	28.474	35.950	61.127

a. Dependent Variable: SES_Stimulation.

b. Covariates appearing in the model are evaluated at the following values: BrAC = .03543.

Pairwise Comparison for Stimulation Rating between Males and Females in the Alcohol (Condition 0) and the AmED (Condition 1) Conditions

Pairwise Comparisons[a]

Condition	(I) Sex	(J) Sex	Mean Difference (I-J)	Std. Error	df	Sig.[c]	95% Confidence Interval for Difference[c]	
							Lower Bound	Upper Bound
Condition 0	Male	Female	-11.688	8.600	29.231	.185	-29.271	5.895
	Female	Male	11.688	8.600	29.231	.185	-5.895	29.271
Condition 1	Male	Female	-17.607*	8.613	29.438	.050	-35.211	-.003
	Female	Male	17.607*	8.613	29.438	.050	.003	35.211

Based on estimated marginal means

*. The mean difference is significant at the .05 level.

a. Dependent Variable: SES_Stimulation.

c. Adjustment for multiple comparisons: Least Significant Difference (equivalent to no adjustments).

The Mean of Stimulation Rating for Males and Females at Each Time-Point

Estimates[a]

Sex	Time	Mean	Std. Error	df	95% Confidence Interval	
					Lower Bound	Upper Bound
Male	.00	28.489[b]	8.434	76.409	11.692	45.286
	1.00	31.114[b]	6.790	44.778	17.436	44.792
	2.00	31.840[b]	6.699	43.423	18.333	45.347
	3.00	33.722[b]	6.701	43.219	20.210	47.234
	4.00	31.876[b]	6.586	41.026	18.575	45.176
	5.00	30.413[b]	6.377	37.043	17.492	43.334
	6.00	34.953[b]	6.858	44.869	21.140	48.766
	7.00	33.004[b]	6.358	36.763	20.119	45.890
	8.00	34.845[b]	6.327	36.441	22.018	47.672
	9.00	28.210[b]	6.231	34.419	15.553	40.868
	10.00	34.760[b]	6.300	35.818	21.980	47.540
	11.00	28.543[b]	6.326	36.580	15.720	41.366
	12.00	28.760[b]	6.343	36.606	15.903	41.617
	13.00	26.726[b]	6.222	34.049	14.083	39.370
	14.00	25.421[b]	6.558	40.662	12.174	38.667
	15.00	29.540[b]	6.498	39.371	16.400	42.681
	16.00	29.000[b]	6.617	42.352	15.649	42.350
	17.00	29.512[b]	6.841	46.218	15.743	43.281
	18.00	29.633[b]	6.833	46.688	15.884	43.382
Female	.00	28.998[b]	8.455	69.671	12.134	45.862
	1.00	44.361[b]	7.015	44.327	30.225	58.496
	2.00	48.587[b]	6.942	43.210	34.588	62.585
	3.00	46.888[b]	6.892	41.737	32.976	60.800
	4.00	48.515[b]	6.871	41.925	34.647	62.383
	5.00	49.431[b]	6.627	37.170	36.006	62.857
	6.00	45.144[b]	7.172	46.008	30.708	59.581
	7.00	49.001[b]	6.709	39.184	35.432	62.569
	8.00	53.220[b]	6.704	39.506	39.666	66.773
	9.00	50.923[b]	6.584	36.860	37.582	64.265
	10.00	55.161[b]	6.853	42.985	41.340	68.982
	11.00	52.074[b]	6.829	42.566	38.297	65.850
	12.00	48.641[b]	6.843	42.471	34.836	62.446
	13.00	46.109[b]	6.630	37.691	32.683	59.535
	14.00	46.286[b]	6.914	43.149	32.344	60.229
	15.00	42.700[b]	6.870	41.799	28.833	56.567
	16.00	37.021[b]	6.869	42.389	23.163	50.878
	17.00	34.185[b]	7.093	46.017	19.907	48.463
	18.00	31.424[b]	6.974	43.944	17.369	45.479

a. Dependent Variable: SES_Stimulation.

b. Covariates appearing in the model are evaluated at the following values: BrAC = .03543.

Pairwise Comparison for Stimulation Rating between Males and Females at Each Time-Point

Pairwise Comparisons[a]

Time	(I) Sex	(J) Sex	Mean Difference (I-J)	Std. Error	df	Sig.[c]	95% Confidence Interval for Difference[c]	
							Lower Bound	Upper Bound
.00	Male	Female	-.509	11.497	63.495	.965	-23.480	22.462
	Female	Male	.509	11.497	63.495	.965	-22.462	23.480
1.00	Male	Female	-13.246	9.699	43.538	.179	-32.800	6.307
	Female	Male	13.246	9.699	43.538	.179	-6.307	32.800
2.00	Male	Female	-16.747	9.576	42.195	.088	-36.070	2.576
	Female	Male	16.747	9.576	42.195	.088	-2.576	36.070
3.00	Male	Female	-13.166	9.553	41.480	.176	-32.451	6.119
	Female	Male	13.166	9.553	41.480	.176	-6.119	32.451
4.00	Male	Female	-16.640	9.541	41.913	.088	-35.895	2.616
	Female	Male	16.640	9.541	41.913	.088	-2.616	35.895
5.00	Male	Female	-19.018*	9.234	37.711	.046	-37.716	-.320
	Female	Male	19.018*	9.234	37.711	.046	.320	37.716
6.00	Male	Female	-10.191	9.950	45.997	.311	-30.219	9.836
	Female	Male	10.191	9.950	45.997	.311	-9.836	30.219
7.00	Male	Female	-15.996	9.269	38.432	.092	-34.753	2.761
	Female	Male	15.996	9.269	38.432	.092	-2.761	34.753
8.00	Male	Female	-18.375	9.262	38.744	.054	-37.112	.363
	Female	Male	18.375	9.262	38.744	.054	-.363	37.112
9.00	Male	Female	-22.713*	9.136	36.793	.018	-41.228	-4.198
	Female	Male	22.713*	9.136	36.793	.018	4.198	41.228
10.00	Male	Female	-20.400*	9.243	38.429	.033	-39.106	-1.695
	Female	Male	20.400*	9.243	38.429	.033	1.695	39.106
11.00	Male	Female	-23.531*	9.283	39.225	.015	-42.304	-4.758
	Female	Male	23.531*	9.283	39.225	.015	4.758	42.304
12.00	Male	Female	-19.881*	9.370	40.272	.040	-38.814	-.948
	Female	Male	19.881*	9.370	40.272	.040	.948	38.814
13.00	Male	Female	-19.383*	9.156	36.899	.041	-37.936	-.829
	Female	Male	19.383*	9.156	36.899	.041	.829	37.936
14.00	Male	Female	-20.866*	9.595	43.090	.035	-40.214	-1.517
	Female	Male	20.866*	9.595	43.090	.035	1.517	40.214
15.00	Male	Female	-13.160	9.526	41.777	.174	-32.386	6.067
	Female	Male	13.160	9.526	41.777	.174	-6.067	32.386
16.00	Male	Female	-8.021	9.616	43.749	.409	-27.404	11.362
	Female	Male	8.021	9.616	43.749	.409	-11.362	27.404
17.00	Male	Female	-4.673	9.917	47.211	.640	-24.622	15.276
	Female	Male	4.673	9.917	47.211	.640	-15.276	24.622
18.00	Male	Female	-1.791	9.821	46.299	.856	-21.556	17.974
	Female	Male	1.791	9.821	46.299	.856	-17.974	21.556

Based on estimated marginal means

*. The mean difference is significant at the .05 level.

a. Dependent Variable: SES_Stimulation.

c. Adjustment for multiple comparisons: Least Significant Difference (equivalent to no adjustments).

F-Statistics for SES: Sedation Rating

Type III Tests of Fixed Effects[a]

Source	Numerator df	Denominator df	F	Sig.
Intercept	1	65.000	28.786	.000
Sex	1	28.988	.636	.432
Session	1	495.085	1.269	.260
Condition	1	676.400	15.090	.000
Time	18	72.974	2.855	.001
Condition * Time	18	75.609	1.276	.228
Condition * Sex	1	617.489	2.929	.087
Time * Sex	18	73.274	1.613	.079
Condition * Time * Sex	18	75.568	.865	.620
BrAC	1	333.773	.260	.611

a. Dependent Variable: SES_Sedation.

The Mean of Sedation Rating for the Alcohol (Condition 0) and the AmED (Condition 1) Conditions

1. Condition[a]

Condition	Mean	Std. Error	df	95% Confidence Interval	
				Lower Bound	Upper Bound
Condition 0	16.904[b]	2.159	29.498	12.492	21.316
Condition 1	13.404[b]	2.124	27.624	9.051	17.758

a. Dependent Variable: SES_Sedation.

b. Covariates appearing in the model are evaluated at the following values: BrAC = .03543.

The Mean of Sedation Rating at Each Time-Point

2. Time[a]

Time	Mean	Std. Error	df	95% Confidence Interval	
				Lower Bound	Upper Bound
.00	10.645[b]	3.467	97.814	3.766	17.524
1.00	10.393[b]	2.857	58.738	4.675	16.111
2.00	12.829[b]	2.606	50.183	7.595	18.063
3.00	10.136[b]	2.481	45.796	5.141	15.131
4.00	12.050[b]	2.307	36.985	7.377	16.724
5.00	12.678[b]	2.356	38.950	7.913	17.443
6.00	12.975[b]	2.312	37.063	8.290	17.660
7.00	14.296[b]	2.638	48.309	8.992	19.599
8.00	15.092[b]	2.519	46.262	10.022	20.161
9.00	16.318[b]	2.533	47.326	11.224	21.413
10.00	16.689[b]	2.910	61.386	10.870	22.508
11.00	14.291[b]	2.721	56.122	8.841	19.741
12.00	19.215[b]	2.771	64.414	13.680	24.749
13.00	18.192[b]	2.798	59.288	12.595	23.790
14.00	19.728[b]	2.830	57.941	14.063	25.394
15.00	20.513[b]	2.799	60.411	14.915	26.110
16.00	16.421[b]	2.536	44.897	11.313	21.528
17.00	18.623[b]	3.049	65.221	12.535	24.711
18.00	16.845[b]	3.043	66.071	10.771	22.920

a. Dependent Variable: SES_Sedation.

b. Covariates appearing in the model are evaluated at the following values: BrAC = .03543.

The Mean of Sedation Rating for the Alcohol (Condition 0) and the AmED (Condition 1) Conditions at Each Time-Point

Estimates[a]

Condition	Time	Mean	Std. Error	df	95% Confidence Interval	
					Lower Bound	Upper Bound
Condition 0	.00	10.215[b]	4.459	47.159	1.245	19.185
	1.00	13.306[b]	3.871	40.479	5.485	21.126
	2.00	15.037[b]	3.316	39.219	8.331	21.743
	3.00	8.222[b]	2.745	44.596	2.691	13.752
	4.00	12.537[b]	2.538	42.846	7.419	17.656
	5.00	14.551[b]	2.616	44.718	9.280	19.821
	6.00	13.102[b]	2.742	41.601	7.567	18.637
	7.00	15.465[b]	3.661	38.122	8.054	22.876
	8.00	17.267[b]	2.886	39.096	11.431	23.104
	9.00	19.650[b]	3.016	40.853	13.558	25.741
	10.00	17.339[b]	2.775	55.768	11.780	22.899
	11.00	16.173[b]	2.985	43.149	10.153	22.193
	12.00	22.052[b]	3.548	51.574	14.932	29.172
	13.00	20.011[b]	3.430	41.621	13.088	26.934
	14.00	18.802[b]	3.235	36.314	12.243	25.361
	15.00	24.165[b]	3.740	40.758	16.611	31.719
	16.00	20.685[b]	3.427	36.561	13.739	27.631
	17.00	21.664[b]	4.349	38.801	12.867	30.461
	18.00	20.932[b]	4.232	38.753	12.370	29.494
Condition 1	.00	11.075[b]	3.797	65.537	3.493	18.657
	1.00	7.480[b]	2.933	49.745	1.589	13.372
	2.00	10.621[b]	2.645	46.208	5.297	15.946
	3.00	12.051[b]	2.818	45.750	6.377	17.725
	4.00	11.563[b]	2.546	43.450	6.429	16.697
	5.00	10.805[b]	2.644	41.005	5.465	16.145
	6.00	12.848[b]	2.324	37.859	8.143	17.553
	7.00	13.127[b]	2.400	39.425	8.274	17.980
	8.00	12.916[b]	2.913	46.026	7.053	18.779
	9.00	12.987[b]	2.838	40.655	7.253	18.721
	10.00	16.038[b]	4.053	37.995	7.833	24.243
	11.00	12.409[b]	3.343	39.044	5.646	19.171
	12.00	16.377[b]	3.025	48.075	10.296	22.458
	13.00	16.373[b]	3.305	39.801	9.693	23.054
	14.00	20.655[b]	3.622	39.705	13.332	27.977
	15.00	16.861[b]	3.001	48.387	10.827	22.894
	16.00	12.156[b]	2.361	37.527	7.374	16.938
	17.00	15.582[b]	3.160	40.985	9.201	21.964
	18.00	12.759[b]	3.281	44.483	6.148	19.369

a. Dependent Variable: SES_Sedation.

b. Covariates appearing in the model are evaluated at the following values: BrAC = .03543.

Pairwise Comparison for Sedation Rating between the Alcohol (Condition 0) and the AmED (Condition 1) Conditions at Each Time-Point

Pairwise Comparisons[a]

Time	(I) Condition	(J) Condition	Mean Difference (I-J)	Std. Error	df	Sig.[c]	95% Confidence Interval for Difference[c]	
							Lower Bound	Upper Bound
.00	Condition 0	Condition 1	-.860	4.532	42.826	.850	-10.000	8.280
	Condition 1	Condition 0	.860	4.532	42.826	.850	-8.280	10.000
1.00	Condition 0	Condition 1	5.825	3.809	39.857	.134	-1.874	13.524
	Condition 1	Condition 0	-5.825	3.809	39.857	.134	-13.524	1.874
2.00	Condition 0	Condition 1	4.415	2.970	31.128	.147	-1.641	10.471
	Condition 1	Condition 0	-4.415	2.970	31.128	.147	-10.471	1.641
3.00	Condition 0	Condition 1	-3.829	2.517	37.870	.136	-8.925	1.267
	Condition 1	Condition 0	3.829	2.517	37.870	.136	-1.267	8.925
4.00	Condition 0	Condition 1	.975	2.138	42.919	.651	-3.338	5.287
	Condition 1	Condition 0	-.975	2.138	42.919	.651	-5.287	3.338
5.00	Condition 0	Condition 1	3.746	2.341	40.149	.117	-.985	8.476
	Condition 1	Condition 0	-3.746	2.341	40.149	.117	-8.476	.985
6.00	Condition 0	Condition 1	.254	2.109	31.048	.905	-4.048	4.556
	Condition 1	Condition 0	-.254	2.109	31.048	.905	-4.556	4.048
7.00	Condition 0	Condition 1	2.338	3.239	27.576	.477	-4.301	8.977
	Condition 1	Condition 0	-2.338	3.239	27.576	.477	-8.977	4.301
8.00	Condition 0	Condition 1	4.351	2.871	37.734	.138	-1.462	10.165
	Condition 1	Condition 0	-4.351	2.871	37.734	.138	-10.165	1.462
9.00	Condition 0	Condition 1	6.662*	2.940	34.334	.030	.691	12.634
	Condition 1	Condition 0	-6.662*	2.940	34.334	.030	-12.634	-.691
10.00	Condition 0	Condition 1	1.301	3.792	31.368	.734	-6.429	9.031
	Condition 1	Condition 0	-1.301	3.792	31.368	.734	-9.031	6.429
11.00	Condition 0	Condition 1	3.764	3.252	31.452	.256	-2.864	10.392
	Condition 1	Condition 0	-3.764	3.252	31.452	.256	-10.392	2.864
12.00	Condition 0	Condition 1	5.675	3.572	46.142	.119	-1.514	12.864
	Condition 1	Condition 0	-5.675	3.572	46.142	.119	-12.864	1.514
13.00	Condition 0	Condition 1	3.638	3.750	40.344	.338	-3.938	11.214
	Condition 1	Condition 0	-3.638	3.750	40.344	.338	-11.214	3.938
14.00	Condition 0	Condition 1	-1.853	3.890	39.035	.636	-9.721	6.015
	Condition 1	Condition 0	1.853	3.890	39.035	.636	-6.015	9.721
15.00	Condition 0	Condition 1	7.304	3.828	40.515	.064	-.430	15.039
	Condition 1	Condition 0	-7.304	3.828	40.515	.064	-15.039	.430
16.00	Condition 0	Condition 1	8.529*	2.986	24.928	.009	2.379	14.680
	Condition 1	Condition 0	-8.529*	2.986	24.928	.009	-14.680	-2.379
17.00	Condition 0	Condition 1	6.082	4.540	39.963	.188	-3.094	15.257
	Condition 1	Condition 0	-6.082	4.540	39.963	.188	-15.257	3.094
18.00	Condition 0	Condition 1	8.173	4.508	43.060	.077	-.917	17.264
	Condition 1	Condition 0	-8.173	4.508	43.060	.077	-17.264	.917

Based on estimated marginal means

*. The mean difference is significant at the .05 level.

a. Dependent Variable: SES_Sedation.

c. Adjustment for multiple comparisons: Least Significant Difference (equivalent to no adjustments).

Appendix D3:

The Biphasic Alcohol Effects Scale (BAES)

F-Statistics for the BAES: Stimulation

Type III Tests of Fixed Effects[a]

Source	Numerator df	Denominator df	F	Sig.
Intercept	1	28.961	7.652	.010
Sex	1	28.210	3.355	.078
Session	1	283.749	7.125	.008
Condition	1	283.288	11.161	.001
Time	6	80.147	8.520	.000
Condition * Time	6	55.698	.285	.941
Condition * Sex	1	265.859	.928	.336
Time * Sex	6	67.130	2.976	.012
Condition * Time * Sex	6	58.150	.738	.621
BrAC	1	178.952	.295	.588
ASQ	1	26.864	.011	.919

a. Dependent Variable: Stimulative_Sum.

The Mean of Stimulation for the Alcohol (Condition 0) and the AmED (Condition 1) Conditions

1. Condition[a]

Condition	Mean	Std. Error	df	95% Confidence Interval	
				Lower Bound	Upper Bound
0	21.498[b]	2.778	27.823	15.806	27.190
1	24.548[b]	2.794	28.404	18.829	30.267

a. Dependent Variable: Stimulative_Sum.

b. Covariates appearing in the model are evaluated at the following values: BrAC = .03199, ASQ = 7.1636.

The Mean of Stimulation Across Time-Points

2. Time[a]

Time	Mean	Std. Error	df	95% Confidence Interval	
				Lower Bound	Upper Bound
.00	17.592[b]	3.545	65.405	10.513	24.670
2.00	25.799[b]	2.956	35.318	19.799	31.799
5.00	25.620[b]	2.904	33.170	19.713	31.527
8.00	26.342[b]	2.961	36.032	20.337	32.346
11.00	26.087[b]	3.050	39.987	19.923	32.251
14.00	20.903[b]	2.949	34.441	14.912	26.893
17.00	18.822[b]	2.984	35.490	12.768	24.876

a. Dependent Variable: Stimulative_Sum.

b. Covariates appearing in the model are evaluated at the following values: BrAC = .03199, ASQ = 7.1636.

The Mean of Stimulation for the Alcohol (Condition 0) and the AmED (Condition 1) Conditions Across Time-Points

Estimates[a]

Condition	Time	Mean	Std. Error	df	95% Confidence Interval	
					Lower Bound	Upper Bound
0	.00	16.093[b]	3.634	64.828	8.835	23.352
	2.00	24.486[b]	3.020	37.423	18.370	30.603
	5.00	23.357[b]	3.133	40.035	17.026	29.688
	8.00	24.456[b]	3.182	44.515	18.046	30.867
	11.00	25.432[b]	3.261	48.854	18.879	31.985
	14.00	19.127[b]	3.171	41.618	12.726	25.527
	17.00	17.536[b]	3.157	39.132	11.152	23.921
1	.00	19.090[b]	4.003	68.378	11.102	27.078
	2.00	27.111[b]	3.240	43.747	20.581	33.641
	5.00	27.883[b]	3.042	36.597	21.718	34.049
	8.00	28.227[b]	3.089	39.948	21.984	34.470
	11.00	26.741[b]	3.106	41.471	20.471	33.011
	14.00	22.678[b]	3.108	38.196	16.388	28.968
	17.00	20.108[b]	3.319	42.780	13.414	26.801

a. Dependent Variable: Stimulative_Sum.

b. Covariates appearing in the model are evaluated at the following values: BrAC = .03199, ASQ = 7.1636.

Pairwise Comparison for Stimulation between the Alcohol (Condition 0) and the AmED (Condition 1) Conditions Across Time-Points

Pairwise Comparisons[a]

Time	(I) Condition	(J) Condition	Mean Difference (I-J)	Std. Error	df	Sig.[c]	95% Confidence Interval for Difference[c]	
							Lower Bound	Upper Bound
.00	0	1	-2.996	2.865	36.800	.302	-8.802	2.809
	1	0	2.996	2.865	36.800	.302	-2.809	8.802
2.00	0	1	-2.625	2.067	36.591	.212	-6.813	1.564
	1	0	2.625	2.067	36.591	.212	-1.564	6.813
5.00	0	1	-4.527*	2.097	39.701	.037	-8.765	-.288
	1	0	4.527*	2.097	39.701	.037	.288	8.765
8.00	0	1	-3.771	2.064	32.208	.077	-7.975	.433
	1	0	3.771	2.064	32.208	.077	-.433	7.975
11.00	0	1	-1.309	1.831	37.650	.479	-5.016	2.398
	1	0	1.309	1.831	37.650	.479	-2.398	5.016
14.00	0	1	-3.552	2.152	42.842	.106	-7.893	.789
	1	0	3.552	2.152	42.842	.106	-.789	7.893
17.00	0	1	-2.571	2.519	39.590	.314	-7.665	2.523
	1	0	2.571	2.519	39.590	.314	-2.523	7.665

Based on estimated marginal means

*. The mean difference is significant at the .05 level.

a. Dependent Variable: Stimulative_Sum.

c. Adjustment for multiple comparisons: Least Significant Difference (equivalent to no adjustments).

The Mean of Stimulation for Males and Females Across Time-Points

Estimates[a]

Sex	Time	Mean	Std. Error	df	95% Confidence Interval	
					Lower Bound	Upper Bound
Male	.00	14.082[b]	4.733	49.371	4.571	23.592
	2.00	22.860[b]	4.242	34.385	14.243	31.477
	5.00	19.173[b]	4.174	32.517	10.676	27.669
	8.00	19.342[b]	4.161	32.396	10.870	27.814
	11.00	18.889[b]	4.122	31.065	10.483	27.295
	14.00	13.323[b]	4.191	32.378	4.791	21.856
	17.00	15.423[b]	4.318	35.843	6.665	24.181
Female	.00	21.101[b]	4.855	50.033	11.351	30.852
	2.00	28.737[b]	4.290	33.074	20.009	37.465
	5.00	32.067[b]	4.337	34.682	23.261	40.874
	8.00	33.341[b]	4.469	39.158	24.303	42.380
	11.00	33.284[b]	4.610	43.436	23.991	42.578
	14.00	28.482[b]	4.453	37.563	19.465	37.499
	17.00	22.221[b]	4.462	37.371	13.184	31.259

a. Dependent Variable: Stimulative_Sum.

b. Covariates appearing in the model are evaluated at the following values: BrAC = .03199, ASQ = 7.1636.

Pairwise Comparison for Stimulation between Males and Females Across Time-Points

Pairwise Comparisons[a]

Time	(I) Sex	(J) Sex	Mean Difference (I-J)	Std. Error	df	Sig.[c]	95% Confidence Interval for Difference[c]	
							Lower Bound	Upper Bound
.00	Male	Female	-7.020	6.456	36.985	.284	-20.101	6.061
	Female	Male	7.020	6.456	36.985	.284	-6.061	20.101
2.00	Male	Female	-5.877	6.152	32.362	.346	-18.402	6.648
	Female	Male	5.877	6.152	32.362	.346	-6.648	18.402
5.00	Male	Female	-12.895*	6.222	34.015	.046	-25.540	-.249
	Female	Male	12.895*	6.222	34.015	.046	.249	25.540
8.00	Male	Female	-13.999*	6.286	35.605	.032	-26.753	-1.246
	Female	Male	13.999*	6.286	35.605	.032	1.246	26.753
11.00	Male	Female	-14.395*	6.267	34.890	.028	-27.120	-1.671
	Female	Male	14.395*	6.267	34.890	.028	1.671	27.120
14.00	Male	Female	-15.158*	6.324	35.496	.022	-27.990	-2.327
	Female	Male	15.158*	6.324	35.496	.022	2.327	27.990
17.00	Male	Female	-6.799	6.441	37.641	.298	-19.843	6.246
	Female	Male	6.799	6.441	37.641	.298	-6.246	19.843

Based on estimated marginal means

*. The mean difference is significant at the .05 level.

a. Dependent Variable: Stimulative_Sum.

c. Adjustment for multiple comparisons: Least Significant Difference (equivalent to no adjustments).

F-Statistics for the BAES: Sedation

Type III Tests of Fixed Effects[a]

Source	Numerator df	Denominator df	F	Sig.
Intercept	1	35.522	6.612	.014
Sex	1	34.225	.200	.658
Session	1	153.469	14.472	.000
Condition	1	203.782	4.217	.041
Time	6	75.412	3.987	.002
Condition * Time	6	66.378	1.178	.329
Condition * Sex	1	175.668	1.155	.284
Time * Sex	6	65.863	1.389	.232
Condition * Time * Sex	6	65.672	1.255	.290
BrAC	1	144.676	.563	.454
ASQ	1	26.763	.036	.852

a. Dependent Variable: Sedative_Sum.

The Mean of Sedation for the Alcohol (Condition 0) and the AmED (Condition 1) Conditions

1. Condition[a]

Condition	Mean	Std. Error	df	95% Confidence Interval	
				Lower Bound	Upper Bound
0	11.699[b]	1.261	43.271	9.156	14.241
1	9.894[b]	1.164	32.081	7.524	12.265

a. Dependent Variable: Sedative_Sum.

b. Covariates appearing in the model are evaluated at the following values: BrAC = .03199, ASQ = 7.1636.

The Mean of Sedation Across Time-Points

2. Time[a]

Time	Mean	Std. Error	df	95% Confidence Interval	
				Lower Bound	Upper Bound
.00	7.034[b]	1.934	118.381	3.204	10.864
2.00	7.567[b]	1.248	39.143	5.042	10.092
5.00	9.564[b]	1.358	48.347	6.836	12.293
8.00	11.454[b]	1.488	62.126	8.480	14.428
11.00	13.964[b]	1.925	76.254	10.129	17.798
14.00	14.911[b]	1.849	69.896	11.222	18.599
17.00	11.081[b]	1.687	59.227	7.705	14.457

a. Dependent Variable: Sedative_Sum.

b. Covariates appearing in the model are evaluated at the following values: BrAC = .03199, ASQ = 7.1636.

The Mean of Sedation for the Alcohol (Condition 0) and the AmED (Condition 1) Conditions Across Time-Points

Estimates[a]

Condition	Time	Mean	Std. Error	df	95% Confidence Interval	
					Lower Bound	Upper Bound
0	.00	6.486[b]	2.209	76.948	2.087	10.885
	2.00	7.630[b]	1.443	43.373	4.721	10.539
	5.00	10.420[b]	1.853	40.470	6.677	14.163
	8.00	13.567[b]	2.073	44.420	9.390	17.745
	11.00	16.244[b]	2.944	39.609	10.292	22.196
	14.00	15.473[b]	2.673	34.629	10.043	20.902
	17.00	12.069[b]	1.972	31.040	8.048	16.090
1	.00	7.582[b]	2.012	101.407	3.591	11.572
	2.00	7.504[b]	1.264	37.815	4.945	10.064
	5.00	8.709[b]	1.335	39.429	6.011	11.407
	8.00	9.341[b]	1.399	44.940	6.523	12.159
	11.00	11.684[b]	1.649	60.297	8.386	14.982
	14.00	14.349[b]	2.034	34.316	10.217	18.481
	17.00	10.093[b]	2.308	30.965	5.385	14.801

a. Dependent Variable: Sedative_Sum.

b. Covariates appearing in the model are evaluated at the following values: BrAC = .03199, ASQ = 7.1636.

Pairwise Comparison for Sedation between the Alcohol (Condition 0) and the AmED (Condition 1) Conditions Across Time-Points

Pairwise Comparisons[a]

Time	(I) Condition	(J) Condition	Mean Difference (I-J)	Std. Error	df	Sig.[c]	95% Confidence Interval for Difference[c]	
							Lower Bound	Upper Bound
.00	0	1	-1.095	1.699	34.794	.523	-4.546	2.355
	1	0	1.095	1.699	34.794	.523	-2.355	4.546
2.00	0	1	.126	1.061	33.772	.906	-2.031	2.283
	1	0	-.126	1.061	33.772	.906	-2.283	2.031
5.00	0	1	1.711	1.748	39.663	.334	-1.823	5.245
	1	0	-1.711	1.748	39.663	.334	-5.245	1.823
8.00	0	1	4.227*	1.913	35.009	.034	.343	8.110
	1	0	-4.227*	1.913	35.009	.034	-8.110	-.343
11.00	0	1	4.560	2.818	33.040	.115	-1.173	10.294
	1	0	-4.560	2.818	33.040	.115	-10.294	1.173
14.00	0	1	1.124	2.981	41.744	.708	-4.893	7.141
	1	0	-1.124	2.981	41.744	.708	-7.141	4.893
17.00	0	1	1.976	2.654	37.661	.461	-3.398	7.351
	1	0	-1.976	2.654	37.661	.461	-7.351	3.398

Based on estimated marginal means

*. The mean difference is significant at the .05 level.

a. Dependent Variable: Sedative_Sum.

c. Adjustment for multiple comparisons: Least Significant Difference (equivalent to no adjustments).

Appendix D4:

Bivariate Correlations

Correlations between Objective and Subjective Judgements in the Alcohol Condition

Correlations

		BrAC	SES_Intox	SES_Impairment	SES_MentalFatigue	SES_Drive	SES_Stimulation	SES_Sedation	BAES_Stimulated_Sum	BAES_Sedation_Sum
BrAC	Pearson Correlation	1	.430*	.339	.067	-.447*	.086	.370	.201	.291
	Sig. (2-tailed)		.025	.084	.741	.019	.671	.058	.314	.141
	N	27	27	27	27	27	27	27	27	27
SES_Intox	Pearson Correlation	.430*	1	.875**	.373	-.687**	.313	.491**	.487**	.517**
	Sig. (2-tailed)	.025		.000	.055	.000	.112	.009	.010	.006
	N	27	27	27	27	27	27	27	27	27
SES_Impairment	Pearson Correlation	.339	.875**	1	.565**	-.622**	.046	.629**	.386*	.706**
	Sig. (2-tailed)	.084	.000		.002	.001	.821	.000	.047	.000
	N	27	27	27	27	27	27	27	27	27
SES_MentalFatigue	Pearson Correlation	.067	.373	.565**	1	-.043	-.259	.718**	.016	.826**
	Sig. (2-tailed)	.741	.055	.002		.832	.193	.000	.938	.000
	N	27	27	27	27	27	27	27	27	27
SES_Drive	Pearson Correlation	-.447*	-.687**	-.622**	-.043	1	-.298	-.182	-.438*	-.278
	Sig. (2-tailed)	.019	.000	.001	.832		.131	.364	.022	.161
	N	27	27	27	27	27	27	27	27	27
SES_Stimulation	Pearson Correlation	.086	.313	.046	-.259	-.298	1	-.147	.503**	-.316
	Sig. (2-tailed)	.671	.112	.821	.193	.131		.463	.008	.108
	N	27	27	27	27	27	27	27	27	27
SES_Sedation	Pearson Correlation	.370	.491**	.629**	.718**	-.182	-.147	1	.300	.790**
	Sig. (2-tailed)	.058	.009	.000	.000	.364	.463		.129	.000
	N	27	27	27	27	27	27	27	27	27
BAES_Stimulated_Sum	Pearson Correlation	.201	.487**	.386*	.016	-.438*	.503**	.300	1	.117
	Sig. (2-tailed)	.314	.010	.047	.938	.022	.008	.129		.561
	N	27	27	27	27	27	27	27	27	27
BAES_Sedation_Sum	Pearson Correlation	.291	.517**	.706**	.826**	-.278	-.316	.790**	.117	1
	Sig. (2-tailed)	.141	.006	.000	.000	.161	.108	.000	.561	
	N	27	27	27	27	27	27	27	27	27

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

Partial Correlation between Subjective Intoxication and Stimulation/Sedation After Controlling for the BrAC in the Alcohol Condition

Correlations

Control Variables			SES_Intox	BAES_Stimulated_Sum	BAES_Sedation_Sum
BrAC	SES_Intox	Correlation	1.000	.453	.454
		Significance (2-tailed)	.	.020	.020
		df	0	24	24
	BAES_Stimulated_Sum	Correlation	.453	1.000	.062
		Significance (2-tailed)	.020	.	.762
		df	24	0	24
	BAES_Sedation_Sum	Correlation	.454	.062	1.000
		Significance (2-tailed)	.020	.762	.
		df	24	24	0

Partial Correlation between Objective Intoxication and Stimulation/Sedation After Controlling for the Subjective Intoxication in the Alcohol Condition

Correlations

Control Variables			BrAC	BAES_Stimulated_Sum	BAES_Sedation_Sum
SES_Intox	BrAC	Correlation	1.000	-.011	.089
		Significance (2-tailed)	.	.958	.665
		df	0	24	24
	BAES_Stimulated_Sum	Correlation	-.011	1.000	-.181
		Significance (2-tailed)	.958	.	.377
		df	24	0	24
	BAES_Sedation_Sum	Correlation	.089	-.181	1.000
		Significance (2-tailed)	.665	.377	.
		df	24	24	0

Correlations between Objective and Subjective Judgements in the AmED Condition

Correlations

		BrAC	SES_Intox	SES_Impairment	SES_MentalFatigue	SES_Drive	SES_Stimulation	SES_Sedation	BAES_Stimulated_Sum	BAES_Sedation_Sum
BrAC	Pearson Correlation	1	.312	.119	-.030	-.484*	.103	.288	-.026	.130
	Sig. (2-tailed)		.129	.570	.887	.014	.626	.163	.901	.536
	N	25	25	25	25	25	25	25	25	25
SES_Intox	Pearson Correlation	.312	1	.915**	.320	-.847**	.174	.481*	.271	.323
	Sig. (2-tailed)	.129		.000	.119	.000	.406	.015	.191	.116
	N	25	25	25	25	25	25	25	25	25
SES_Impairment	Pearson Correlation	.119	.915**	1	.451*	-.704**	.118	.608**	.274	.414*
	Sig. (2-tailed)	.570	.000		.024	.000	.574	.001	.185	.040
	N	25	25	25	25	25	25	25	25	25
SES_MentalFatigue	Pearson Correlation	-.030	.320	.451*	1	-.275	-.190	.564**	-.185	.712**
	Sig. (2-tailed)	.887	.119	.024		.183	.364	.003	.377	.000
	N	25	25	25	25	25	25	25	25	25
SES_Drive	Pearson Correlation	-.484*	-.847**	-.704**	-.275	1	-.034	-.320	-.144	-.308
	Sig. (2-tailed)	.014	.000	.000	.183		.872	.119	.492	.135
	N	25	25	25	25	25	25	25	25	25
SES_Stimulation	Pearson Correlation	.103	.174	.118	-.190	-.034	1	-.068	.841**	-.170
	Sig. (2-tailed)	.626	.406	.574	.364	.872		.748	.000	.416
	N	25	25	25	25	25	25	25	25	25
SES_Sedation	Pearson Correlation	.288	.481*	.608**	.564**	-.320	-.068	1	.012	.824**
	Sig. (2-tailed)	.163	.015	.001	.003	.119	.748		.955	.000
	N	25	25	25	25	25	25	25	25	25
BAES_Stimulated_Sum	Pearson Correlation	-.026	.271	.274	-.185	-.144	.841**	.012	1	-.020
	Sig. (2-tailed)	.901	.191	.185	.377	.492	.000	.955		.924
	N	25	25	25	25	25	25	25	25	25
BAES_Sedation_Sum	Pearson Correlation	.130	.323	.414*	.712**	-.308	-.170	.824**	-.020	1
	Sig. (2-tailed)	.536	.116	.040	.000	.135	.416	.000	.924	
	N	25	25	25	25	25	25	25	25	25

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

Partial Correlation between Subjective Intoxication and Stimulation/Sedation After Controlling for the BrAC in the AmED Condition

Correlations

Control Variables			SES_Intox	BAES_Stimulated_Sum	BAES_Sedation_Sum
BrAC	SES_Intox	Correlation	1.000	.294	.299
		Significance (2-tailed)	.	.164	.155
		df	0	22	22
	BAES_Stimulated_Sum	Correlation	.294	1.000	-.017
		Significance (2-tailed)	.164	.	.937
		df	22	0	22
	BAES_Sedation_Sum	Correlation	.299	-.017	1.000
		Significance (2-tailed)	.155	.937	.
		df	22	22	0

Partial Correlation between Objective Intoxication and Stimulation/Sedation After Controlling for the Subjective Intoxication in the AmED Condition

Correlations

Control Variables			BrAC	BAES_Stimulated_Sum	BAES_Sedation_Sum
SES_Intox	BrAC	Correlation	1.000	-.121	.033
		Significance (2-tailed)	.	.574	.879
		df	0	22	22
	BAES_Stimulated_Sum	Correlation	-.121	1.000	-.118
		Significance (2-tailed)	.574	.	.583
		df	22	0	22
	BAES_Sedation_Sum	Correlation	.033	-.118	1.000
		Significance (2-tailed)	.879	.583	.
		df	22	22	0

Appendix D5:

The Beverage Rating Scale (BRS)

The F-Statistics for the BRS: ED

Type III Tests of Fixed Effects[a]

Source	Numerator df	Denominator df	F	Sig.
Intercept	1	76.549	141.350	.000
Sex	1	31.001	.012	.913
Session	1	154.308	33.216	.000
Condition	1	142.221	.057	.812
Time	4	52.202	32.138	.000
Condition * Time	4	42.562	1.195	.327
Condition * Sex	1	129.936	1.509	.221
Time * Sex	4	44.286	1.702	.167
Condition * Time * Sex	4	43.227	1.907	.126
BrAC	1	134.608	3.898	.050

a. Dependent Variable: ED_Total.

The Mean of Perceived ED Consumption for the Alcohol (Condition 0) and the AmED (Condition 1) Conditions

1. Condition[a]

Condition	Mean	Std. Error	df	95% Confidence Interval	
				Lower Bound	Upper Bound
Condition0	2.013[b]	.143	30.416	1.720	2.305
Condition1	2.027[b]	.139	26.946	1.742	2.311

a. Dependent Variable: ED_Total.

b. Covariates appearing in the model are evaluated at the following values: BrAC = .03754.